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ABSTRACT

The study reviews orthodox theories of labor markets, presents new formulations of segmentation theory, and provides empirical tests of segmentation in the United States and several developing nations. Orthodox labor market theory views labor as being paid for its contribution to production and that investment in education and vocational training for the poor will yield payoffs equal to gains by higher income whites. Segmented labor market theory explains how and why workers', owners', and managers' labor markets function differently and why the labor market is fragmented into persisting groups with options restricted by historical, systematic forces. The document is presented in seven chapters. Chapter I stresses the importance of economic theories to educational planning, introduces segmented labor market analysis, and explains how segmented labor market analysis relates to planning processes in industrializing societies. Chapter II presents orthodox theories of labor markets to bring the reader up to date and to provide a framework for contrasting segmentation theories with orthodox literature. Chapter III describes dual labor market theories and offers criticisms of these theories by economists. Chapters IV and V examine the validity of U.S. and Third World labor market characteristics as predicted by segmentation analysts. Chapter VI analyzes implications of segmentation theory for development planning. The final chapter presents an agenda for future research. (Author/DB)

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SEGMENTED LABOR MARKETS: A REVIEW OF THE THEORETICAL AND EMPIRICAL LITERATURE AND ITS IMPLICATION FOR EDUCATIONAL PLANNING

by

MARTIN CARNOY

January 1977

Center for Economic Studies and Stanford University

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Martin Carnoy

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CHAPTER I

Introduction

Much of the research in the economics, sociology, and politics of education hinges on implicit assumptions about relations in production and the functioning of labor markets. Thus the theoretical basis for educational investments and educating planning in many countries rests on an unstated theory of the behavior of employment, productivity, and income in response to educational expansion.

Recently, with the failure of the "War on Poverty" to improve significantly the employment and wages of the poor in the United States, American economists began to question whether the assumptions of orthodox (neo-classical) economic theories of labor markets really provide an accurate reflection of industrial country conditions. Essentially, these economists could not reconcile race, sex, and social class discrimination with the orthodox view that investment in the education and vocational training of the poor should yield pay-offs equal to gains by higher income white people. Why did the training programs of the "War on Poverty" produce such low gains for those who were trained?

Out of this questioning came three kinds of answers: the first was a revision of orthodox theory which attempted to explain without questioning the fundamental neo-classical assumptions why more education and training could produce different results for different groups in the society. The second was also an extension of neo-classical theory, but it attempted to explain the observed phenomena with the concept of technological differences in the kinds of firms worked in by more skilled, primarily white male workers and the firms worked in by less skilled workers, many of whom are women and minority males. It is these latter firms that the unemployed poor would have to enter once trained by anti-poverty programs. Such "dual labor market" theories described differences in the nature of promotion and pay scales faced by different groups of workers. The third kind of answer argued that there were differences in the kinds of markets faced by different groups of workers but that these differences did not arise out of technological considerations but out of the contradictions of capitalist development. The failure of the "War on Poverty" in that view was inherent in the nature of capitalist production. "Segmentation" of labor markets emerged from historical conflicts between owners of capital/managers of capital and workers. Thus, radical segmentation theory attempts to provide an entirely different theoretical economic framework to analyze the functioning of labor markets.

Of course, the concept of differences in labor markets is not a new idea: J.H. Boeke write of "dual" labor markets in the 1930s. (Boeke, 1951) when he described conditions in the Dutch East Indies (Indonesia). He contended that cultural differences created a rapidly backward-bending supply curve for labor in the "traditional" part of the Javanese economy. Native labor, according to his model, simply did not have the motivation to accumulate wealth (savings) beyond their immediate needs, so they only worked as much as necessary to meet those needs. Meanwhile, in the dynamic (European) sector of the economy, native workers were motivated by higher wages to work more hours and to accumulate beyond their basic consumption needs. Hla Myint (1965) and

Benjamin Higgins (1957) wrote of technological dualisms between the traditional and modern sectors of the economy. These dualisms were rooted in the nature of modern technology, which could only absorb a small percentage of the labor force which would and could work in the dynamic sector at the higher wages offered. The low absorption rate forced most of low-income countries' labor forces to remain in the low-productivity, excess-labor, traditional sector of the economy, primarily in subsistence farming and low-skill services.

Both of these dualisms attempted to explain how large wage differentials could exist between traditional and modern sectors over long periods of time without the expected (by neo-classical theory) downward movement occuring in the modern sector as increased labor shifted from the traditional, and upward wage movement in the latter as labor shifted out to work in the high wage sector. Later on, human capital theory (which we shall review below) explained this phenomenon by differences in the personal attributes of workers in the two sectors rather than by differences in the characteristics of the sectors themselves.

Yet despite these different explanations, both dualistic and human capital theories accepted major premises of neo-classical economics, and was rooted in neo-classical development concepts: individuals were born equal and came to different economic positions in life through their own choices, freely taken, and their own motivation to succeed. Workers were paid their marginal product by profit-maximizing owners of physical capital, but in essence, these capitalists were no different from workers except in that they had entrepreneurial ability and liked (were motivated) to manage firms rather than work as employees. But there was no inherent difference in the rights society accorded to a capitalist or a worker. Each had equal legal and bargaining power in the marketplace. While Boeke may have evoked some nostalgia for the "[illegible] savage" and the love that traditional societies had for tradition, as an analyst he implicitly accepted the premise that the natives behaved the way they did entirely because they chose that way of life. Later work by Tax (1963) in Guatemala and Yotopoulos (1967) in Greece questioned the "irrationality" (in capitalist terms) of traditional, very low income farmers: those studies indicate that poor societies are not poor because they allocate resources in an inefficient way; rather, they are poor because they lack resources, particularly high yield resources (Schultz, 1964).

But this still does not explain why the poor find themselves employed in low yield activities and the better-off workers, in high productivity activities. Is it simply a matter of education and training, or of making the right individual choices? Segmentation theory contends that it is not. That analysis argues that a significant part of the differences in wages paid to different groups in society is a function of the structure of production; i.e., who controls the means of production and for what purposes production is used. Capitalist production is run by owners of capital and primarily for the reproduction of capitalism itself. This means that even if such production is inefficient from the standpoint of the society as a whole (for example, it may provide the basic necessities of life to only a small percentage of the population) any change in the organization or ownership of production is considered a threat to that minority who own capital. Segmentation theory argues that out of the inherent antagonism of labor and capitalists, arising from the drive by capitalists to accumulate ever-increasing amounts of capital (at the expense of workers and peasants), members of the working class are pitted against each other through "segmenting" them into different groups paid different wages and doing different kinds of work (not necessarily more or less "productive" work! just different kinds of work). Therefore, segmentation theory would explain dualisms in the labor force primarily through the differential exploitation (treatment) of different groups of workers, and the relative poverty of one group rather than another not because of the different individual choices made by them individually, but primarily by the historical struggles that left one group in a less advantageous bargaining position relative to another.

In these circumstances, it should be clear that the underlying theory of labor markets would greatly affect educational planning. Under segmented labor market theory, investing in more schooling, for example, would not necessarily lead to higher incomes for those who were getting the schooling if it were not possible for them to keep the gains of their higher productivity (under the assumption that schooling does increase worker productivity). Neo-classical theory would automatically assume that increases in productivity would eventually be rewarded with equal increases in wages. Thus, investment in the education of the "disadvantaged" would not necessarily make them more advantaged under one theory while it would under another. In the former view, the eco-political context of the investment in education is as important as the investment itself. It could therefore be possible to increase national product in part through investment in education of the poor, but prevent, through State incomes policies or simply the conditions of private

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capitalist development, the participation (in terms of increased per capita income) of the poor in that growth. Similarly, under segmented labor market theory, there could be a change in the distribution of education in the labor force (a change in the distribution of labor's personal characteristics) without a change in the distribution of earnings, while in neo-classical theory of labor markets, the two would be highly correlated (Carnoy and Carter, 1975).

In this study, we review existing theories of labor markets, present some new formulations of segmentation theory, and then empirical tests of segmentation in the United States and a few low-income countries. We relate our conclusions about segmented labor market analysis to the planning process in industrializing societies, particularly to the role that education might play in growth, income distribution, and employment in the framework of segmented labor markets.

One of the most important difficulties of testing the empirical validity of segmentation as a mode of analysis is that the principal arguments for such a theory of labor markets are historical. In other words, at a single point in time, we cannot observe the dialectical process which has resulted in segmentation. Thus, much of the criticism of segmentation analysis (which we review below) and, in fact, our own "empirical" tests, based on cross-section data and regression estimates of mobility between and within segments, do not get at the principal issue raised by the analysis: is the proper framework to study labor markets in capitalist societies the neo-classical theory of the firm and marginal productivity or class conflict and dialectical materialism? This is a historical as well as cross-sectional issue, and we cannot treat it adequately in this study (see Center for Economic Studies, 1976, for an historical analysis of labor markets and education).

Keeping this important caveat in mind, we discuss this new development in labor market theory in both a U.S. and international context and attempt to show its relevance for the planning of education. Neoclassical (orthodox) theories of labor markets are presented briefly in Chapter 2 as a way of bringing the reader up-to-date on the recent work in orthodox theory and to provide a framework for contrasting dual labor market and segmentation theories with the orthodox literature. Chapter 3 describes dual labor market and segmentation theories (including our own version of segmentation theory) and criticisms of those theories by orthodox economists. Empirical tests of the "validity" of some labor markets characteristics as predicted by segmentation analysis are discussed in Chapters 4 and 5, divided into U.S. studies (Chapter 4) and studies in the Third World (Chapter 5). Chapter 6 analyzes the implications of segmentation theory for development planning and Chapter 7 presents an agenda for future research on this subject -- a type of "Where do we go from here?"

It will be clear from our study that although much work has been done recently in attempting to bring labor market theory into line with the "real" world of labor and production, we are far from understanding precisely how labor markets work, especially in low-income countries. It will also become clear that orthodox and radical economists will have great difficulty agreeing on the nature of these markets because of the important differences in their historical analysis of labor-capital relations in capitalist society, and, indeed, their entire view of history and the role of capitalist development in the historical process.

CHAPTER 2

Orthodox Models of Labor Markets

The orthodox view of labor markets has implicit within it a particular view of the firm and the relationship between capital and labor in the society at large. The orthodox interpretation of the rise of capitalism is based primarily on the increased efficiency of the division of labor in repetitive tasks and the increased production possibilities afforded by new technology. In that interpretation, workers and capitalists did not conflict; rather, the new methods of production and new technology afforded the possibility of greater production and new technology afforded the possibility of greater production and therefore increased employment opportunities at higher wages -- this is what neo-classical economists contend "attracted" workers into the factories (Marglin, 1974). In other words, the capitalist was a "facilitator," bringing workers together in new ways that increased productivity. He also provided the capital necessary to buy machinery. For these two functions he received a return; workers got their marginal product, and the system operated in an atmosphere of individual free choice and equality of political power between individual workers and individual capitalists. In this model, the firm is subject to technical constraints, but otherwise, it is seen as maximizing outputs subject to the prices of inputs (including labor) and outputs. The monopoly firm is seen as maximizing the value of output subject to prices of inputs (and technology). The prices of goods and inputs, in turn, are set by the supply and demand for these commodities in generally free markets.

That view of the capitalist economy/society considers that labor markets function to allocate a vector of labor force characteristics to a vector of labor force demands (derived from the demand for goods) such that equilibrium prices are established for all labor services. If a labor force characteristic has a price which is higher than the cost of acquisition of that characteristic, individuals will acquire the characteristic and bid down its price. At the same time employers will seek to design technology which economizes on the use of high priced, scarce characteristics. Assuming that both employers and employees have perfect information about all prices and acquisition costs of characteristics, assuming that there are no restrictions on individual choice (e.g. inability to borrow funds, union restrictions, etc.), the unfettered operation of the labor market can be mathematically demonstrated to yield as efficient a matching of jobs and men as an economist could devise even if he knew something about workers and machines. Thus, from this perspective, detailed knowledge of the interaction of worker characteristics and job characteristics is redundant.

The problem, of course, is that labor markets don't, in fact can't, work in the postulated fashion. On the most abstract theoretical level the problem is that supply and demand are not measured in the same units. That is, workers supply a set of characteristics such as strength, coordination, IQ, education, docility, etc., while employers seek the workers who will increase the firm's output by the greatest amount. Workers supply characteristics; employers demand "marginal productivity." Unless labor theory is able to specify a set of functional relationships between characteristics supplied by workers and the units of employer demand, then it cannot logically assert that workers characteristics have "prices" attached to them which move so as to equilibrate the supply of and demand for those characteristics across jobs. It is, of course, possible that no such general set of functional transformation between worker attributes and productive capacity exists. Perhaps each employer has his own individual more or less arbitrary criteria for selection of employees. Melvin Reder expresses this problem thus: "It is at least possible that the characteristics employers seek -- consciously or otherwise -- cannot be transformed into those that workers supply. If this is the case, then imbalances between supply and demand have to be adjusted by non-price rationing and/or by adjustments of characteristics offered . . . If so, institutional rules governing these procedures would have to be built into the theory as an integral part." (M. Reder in L. Soltow, 1969, p. 228)

While Reder focuses clearly on the central problem with orthodox wage competition theory, he provides no solution. However, other economists have in recent years attempted to salvage the orthodox theory or to construct new theories of labor market behavior in which some combination of institutional rules, non-price rationing and adjustments of offered characteristics play an integral role in determining wages and income. All of these theories consider the schooling process to be intimately related to labor market behavior, but the nature of the interrelationship varies markedly among the theories according to the assumptions each theory makes about the attributes which cause one man to be more "productive" than another.

Human Capital and Extensions of Human Capital Models

The most well established and widely known of these models is the human capital model. According to this concept, all productivity relevant differences between individuals can be scaled along a single dimension -- the "amount" of human capital possessed by an individual. An individual "acquires" human capital through investment in education and post-school investments in on the job training (see Becker, 1964, and Mincer, 1970). Extreme versions of this theory even refer to pre-school differences in parental attention and nutrition as investments in human capital, though no researcher has yet attempted to quantify the effects of such differences.

The basic assumption made about individual behavior is that individuals "invest" in human capital up to the point where the cost of acquisition of a unit of human capital in terms of income foregone and training fees equals the discounted value of the expected future income increments resulting from the investment. Aggregation of the outcomes of all such individual decisions gives the "supply" of human capital. Meanwhile employers ascertain how much additional output can be produced by an individual with an extra year of schooling or an extra year of on-the-job training. Competition in labor markets combined with employers' desire to maximize profits will drive them to hire workers up to the point where the wage paid equals the wage for totally unskilled labor plus the value of the additional output made possible by the individuals' education and training. Aggregation of all employers' decision gives the "demand" for human capital. If the "supply" and "demand" for human capital are unequal, the "price" of human capital, i.e., the incremental wage accruing to an additional unit of human capital, moves so as to adjust the imbalance. An increase in the price increases the supply because it increases expected income from human capital investment and, hence, the attractiveness of that investment. At the same time, a price increase is assumed to decrease the demand because educated workers must be laid off if the value of the additional output attributable to education and training is to rise so as to equal the increased wage. A decrease in price leads to opposite reactions by employers and workers so as to increase demand and decrease supply.

Notice that this theory seems at first glance to solve the problem of the incommensurability of the units in which supply and demand are measured. The solution is dramatically simple. Workers supply what employers demand -- human capital. Nearly all economists who use human capital models believe either explicitly or implicitly that the major components of productivity under modern technological conditions are cognitive skills, increases "capacity to learn," and teaches some technical skills. On-the-job training teaches technical skills. Differences between individuals in personality traits, values, modes of self-presentation, etc., are assumed to be completely secondary components of productivity and hence are seldom discussed and never systematically incorporated in human capital models. Years of schooling completed and years of experience are, then, good indices of an individual's productive ability, his intellectual and technical skills. Moreover, years of schooling and job experience are easily observable by employers so that they have little problem relating the factor supplied, 'human capital," to productive capacity.

There are some formal problems with this formulation caused by the fact that different jobs may offer different learning opportunities. For instance, more productive skills can be learned in three years of a managerial training program than in three years as a janitor. Sherwin Rosen has resently attempted to formulate a human capital model which would accommodate these distinctions between jobs (S. Rosen, 1972). In his model every job offers some combination of current income and training opportunities. Competitive markets establish premiums on jobs offering greater human investment opportunities. That is, jobs which offer greater training opportunities pay, ceteris paribus, lower salaries. The size of the differential is determined by the costs to firms of providing training opportunities and by distributions of worker abilities and "tastes" for present as opposed to future income. In this model the "price" of the training opportunities on a job is related to the "maximum learning potential" the job provides. This price is the same to everyone, regardless of their "ability" to actually learn on the job. Therefore, those who have a high learning ability are the most likely to invest in jobs with large learning opportunities, because their productivity and future wages will be increased more by the job than will someone's with a lower learning ability.

Rosen wants this last feature in his model because he wants to explain why the age-income profiles of those with large amounts of schooling rise faster than those with little schooling. For Rosen, schooling not only increases cognitive skills, but also the ability to learn (Rosen, 1972, p.339). Therefore, those with more schooling take jobs with high investment opportunities, and their productivity and wages rise faster than those with little schooling. However, this explanation involves us again in our initial theoretical problem, i.e., How can employers use years of experience on a job as an index of productive capacity when different individuals acquire different amounts of human capital on the same job? In fact, how can human capital be measured even in a theoretical sense? In the original human capital models, years of schooling and years of on-the-job training could be aggregated into the single factor "human capital" by aggregating the present income foregone while staying in school and while taking jobs with training programs. But once Rosen specifies that individuals acquire different amounts of human capital even though each pays the same price (foregoes the same amount of income), aggregate income foregone no longer yields an unambiguous "amount" of human capital.

We don't wish to dwell at great length on this problem, because it is subsidiary to the major weakness which vitiates the logic of both the human capital model and its extension by Sherwin Rosen. That is, these models assume what most needs proof -- that there is a scarce quantity of "human capital" which per se contributes something to production and receives a price for the services "it" contributes. For instance, we might hypothesize the following example in which schooling is correlated with productivity but contributes nothing to productivity. Employers in the absence of other easily obtainable information about an individual's docility, ability to follow directions, reliability, willingness to sublimate personal desires for the sake of external rewards, etc. use years of formal education as a screening device. Assume that these traits are integral components of "productivity" within a hierarchically organized, highly specialized job structure, and that the school system functions very well to weed out those who do not possess these traits. In this case there will be a high correlation observed between years of schooling (dollar investments in human capital) and future income. But the schooling has contributed nothing to productivity. The investment in schooling benefits the individual by allowing him access to stable, high paying jobs, but contributes nothing to his performance on the job, does not increase society's total stock of productive resources.

Of course, we do not wish to assert that schooling contributes nothing to worker's abilities to produce goods and profits for their employers. A much more plausible assumption is that the school environment rewards and hones a number of traits useful to production in hierarchical job structures characterized by minute subdivision of tasks. But there is some empirical evidence which suggests that schooling does perform a "screening" function which is partially independent of any actual contributions to worker's productivity. For instance, it has often been noted that the incremental return to a year of schooling in which a degree is granted is much greater than for intermediate years. This is especially true for black students (P. Andrisani, 1971, p. 81). Moreover, there have been secular increases in schooling requirements for many jobs (O'Toole, et. al., 1973, p. 135). Finally, returns to education have been found to be lower for blacks, and to decrease relative to white returns as educational level increases (Arrow, 1970, p. 8). None of these facts are easily encompassed by a theory asserting that a "year of schooling" is a scarce productive factor which commands a price for the services "it" contributes to production. However, all are compatible with a theory which acknowledges that employers in the absence of any low cost method of determining an employee's potential productivity use easily observable personal characteristics such as schooling, race and sex to prejudge productive ability.

Signalling Models

Disturbed by the anomalies mentioned in the preceding paragraph, many orthodox economists have abandoned human capital models and begun work on "signalling" and "sorting" models (Arrow, 1972; D. Starrett, 1973; M. Spence, 1973). In reviewing these models, we will concentrate on Michael Spence's version since it is most susceptible of non-technical exposition and contains all the seminal insights of this group of models. The central concept of the signalling model is that hiring is an investment under uncertainty. Phrased in terms of our initial problem, employers know what they want -- productivity -- but they don't know how to tell what productivity relavant traits a worker has, and perhaps don't even know what combination of traits is most productive in their particular job situation. (Signalling models themselves make no attempt to identify the characteristics which cause individual productivity differences.) However, after some period of observation of a worker's performance, employers are able to gauge more or less accurately his productivity. It is this discrete time lag involved in learning an individual's productive capabilities which makes the hiring decision subject to risk.

Though the employer is initially uncertain of a given worker's productive capacity, the employer is able to observe a variety of personal data such as age, race, sex, education and test scores. Those traits which the worker cannot alter, such as race and sex, are termed "indices," while those that are alterable are termed "signals." Based on previous market experience with different combinations of signals and indices the employer is assumed to form conditional assessments of any individual's productive capacity. It is these subjective assessments of productivity which determine the wage offered. Given the offered wage schedule for different levels of a signal, workers will acquire the amount of the signal which maximizes the difference between offered wage and cost of acquisition of the signal. Equilibrium in this model is attained when the employer's expectations about productivity of individuals with given signal levels are confirmed by the actual performance of those individuals. Under these conditions there will be no tendency for employers to change offered wage schedules and, hence, no incentive for individuals to change the amounts of signals they acquire.

An important requirement for this type of equilibrium to exist is that the unit cost of signal acquisition be negatively correlated with productivity. That is, those people who are more productive independent of schooling must face lower education costs in order for education to function as a signal. This requirement is indirectly a consequence of the assumption that schooling per se contributes nothing to productivity. If schooling had a productive component, the conditions of equilibrium would still impose requirements on the distribution of signalling costs, but these could not be generally stated and would depend on the specific functional forms considered. Let us follow Spence, then, and assume that education contributes nothing to productivity. In this case it is easy to see why "ability" and unit signalling costs must be negatively correlated. If the unit costs were equal for everyone, everyone would invest in the same amount of education, since offered wages depend only on amount of education. If costs of education were randomly distributed or positively correlated with productivity, individuals would invest in different amounts of education, but employers would gradually observe that amount of education was uncorrelated or negatively correlated with productivity and would cease to offer wage premiums for education. Therefore, education can only function as a signal so long as more productive individuals have lower education costs at each level of schooling.

However, if this requirement is fulfilled, then there are potentially an infinite number of equilibrium wage schedules. That is, there may be many sets of relative wages such that it will be worthwhile only for the more "able" to take a lot of schooling, thereby confirming the employer's initial belief that a high level of schooling indicates a high level of productivity. This possibility of multiple equilibria is very damaging to orthodox beliefs about the efficiency of competitive labor markets. In particular the indefinite continuation of sexually and racially based discrimination becomes a distinct possibility within this model. If employers for any reason expect certain racial or sex groups to have lower productivity, they might set the education requirements for those groups at a higher level than the education requirement for white males on the same job. In fact, the education requirement might be set so high as to price women and minority groups out of some jobs altogether. Looked at from the outside, it might appear that the problem faced by these groups was inadequate schooling, whereas this model locates the problem in the information structure of the market itself (Spence, 1973, p. 373).

This model is attracting considerable attention by orthodox economists despite its undermining of their traditional faith in the efficacy of markets because it provides an "explanation" for discrimination which is consistent with profit maximization and individual freedom of choice. More importantly, the model carries the comforting implication that equal rights anti-discrimination legislation can force employers to gain the experience with blacks and women necessary to demonstrate to them that these groups are as competent as white males. Once they have realized this, employers will presumably gladly comply with the law. In short, labor markets may have their problems, but we can fix them fairly easily, without major institutional changes or pronounced social conflict.

Discrimination by sex and skin color and apparently excessive general education entry requirements for jobs are comprehensible within a signalling model and anomalous within a human capital framework. Yet substantive questions about labor market processes are left unanswered by the signalling models. Most evidently, the model gives no indication of which worker traits are productive, let alone describe the manner in which such traits are produced. Without a theory of the constituent elements of productivity and the processes of their production, what justification is there for the assumption that the costs of education are inversely related to productivity? Similarly, there is no analysis of why employers initially believe blacks or women to be less productive than white males. In fact, according to this model employers might just as easily have initially assumed whites and men to be less productive, and it is a mere matter of chance that the opposite assumptions were made. Why do employers focus on sex and skin color anyway? Why not on height and hair color? This model gives no answer to these questions and thus does not really "explain" discrimination.

Finally, the schooling process is a "black box" in these signalling models. Even granting the admittedly extreme assumption that schools produce nothing and merely function to "weed" out less productive individuals, it would be useful to know how they perform this function. Are monetary or psychic "costs" the determining factor? If the latter, do the psychic costs result from "inability to learn" or from incapacity to find motivation in an alienating environment? The answers to such questions are obviously central to a determination of how schools must change to accommodate a change in job structures in the direction of increased workers' control. At best the signalling models are an incomplete theory of labor market behavior and processes.

Job Competition Model

A more institutionally oriented model than any we have so far considered is the job competition model of Thurow and Lucas (Thurow and Lucas, 1972). The most novel feature of this model is that labor supply plays little or no role in wage determination. That is, the characteristics that workers supply with the exception of "trainability" are unimportant in determining their potential productivity on the job. This is because "productivity" is an attribute of jobs not people. Jobs in which the worker works with a lot of modern capital equipment are high productivity jobs. Workers queue up for such jobs. Once a worker is hired the cognitive skills necessary to raise his productivity up to the productivity of the job are learned through formal and informal training programs. The chief criteria which employers use in selecting workers for jobs is "trainability."

Those workers who possess background characteristics which employers feel reduce training costs go to the head of the queue and receive the "best" jobs. Once a worker has landed a good job and received the training necessary to raise his productivity to that of the job, the incremental time necessary to train him for the next job up the job ladder is likely to be less than the training time necessary for a new employee recruited from outside the firm. Thus, structured "internal labor markets" develop. Even if most of the skills necessary on a particular job are "general" (i.e. learnable and useable outside the firm), Thurow and Lucas maintain that a residuum of specific skills exists such as knowledge of location of tools, experience in working with specific production teams, etc. The existence of these specific skills means that employers always have an interest in reducing training costs.

Since a worker's position in the "trainability" queue directly determines his job opportunities and income, Thurow and Lucas discuss, albeit in a cursory manner, the determinants of queue position. These include education, age, sex, psychological tests, and previous experience. "Subjective" elements such as race and sex may enter labor queue determinations even if there are no objective differences in training costs between the relevant groups. This follows from the assumption that marginal productivity is an attribute of jobs, not people, and from the assumption that the existence of queues does not cause wages to fall. Thus, if all individuals have equal training costs, blacks and women can't be placed at the bottom of the queue with no loss in efficiency. Thurow and Lucas leave open the question of whether education actually reduces training costs of whether it serves merely as a screening device. They seem to learn towards the view that education actually reduces training time for both general and specific skills. However, contentional rate of return studies which measure the income gaps between those with different levels of schooling holding other factors such as age, "ability," and socioeconomic class constant do not, under the assumptions of this model, measure correctly the gains from education either to the individual or to society. For example, if employees bear training costs through reduction of wages during training periods, then an increase in the supply of college educated laborers merely means that they take over some of the jobs formerly held by high school laborers. The gains to society from the increased education are measured by the rise in wages, reflecting reduced training time, in those jobs taken over from high school educated labor. Traditional rate of return studies in this situation measure the gap between average incomes of college graduates and average incomes of high school graduates. This is an overestimate according to the assumptions of the job competition theory, because the wages of the college graduates would be higher than the wages of high school graduates (even if the former never went to college) simply because the college graduates are employed in jobs with a high productivity.

To this job competition model of income determination, Thurow and Lucas append what they refer to as "sociological factors." The most salient of these is the "sense of justice among workers and employers." This sense of justice plays a role whenever there are increasing or decreasing returns to scale, where determination of individual marginal products is "costly," or where workers wage preference systems are interdependent and conditioned by experience and history.

While the Thurow-Lucas analysis seems to explain phenomena such as seniority provisions, constancy of wages in the face of excess supplies of labor, the existence of highly structured internal labor markets, the secular increase of educational requirements; and while it is not inconsistent with persistent discrimination against blacks and women, it begs many important theoretical questions. Most glaringly, they never really give any reason why labor supply plays no role in wage determination, yet all the novel features of their model stem from this assumption. Specifically, if the only effect of education is to reduce training costs, why don't workers with less education offer to pay extra training costs on a job rather than accept a position lower down in the labor queue? Why isn't there a tradeoff between staying in school and eventually getting a high wage job or leaving school and accepting the same job today at a lower wage? If such an option were open, then wage competition and the influence of supply on wage determination would be restored. The Thurow-Lucas model would collapse into a human capital model. Of course, we all know that such an option typically does not exist. But why not? Thurow and Lucas never answer this critical question, and nothing in the logic of their model excludes such an option.

A second and more basic weakness of the Thurow-Lucas model is its extreme technological determinism. Productivity is determined by attributes of technology, not the worker. But what forces the employer to pay the worker the value of his marginal product? In orthodox theory competition among workers for jobs, among employers for workers, and substitution possibilities between capital and labor imply that workers will be paid the value of their marginal product in equilibrium. Employers would like to pay workers less, but they can't because the workers would quit and be hired by some competitor. But in the Thurow-Lucas model we have queues of workers eager to work at the "good" jobs. Why aren't wages bid down by these eager workers? Employers don't continue to pay wages equal to marginal products because it is "fair;" they pay them this much because it is "profitable." Thurow and Lucas have apparently never learned this fundamental lesson economic theory. If we observe an absence of wage competition in the real world, then one of the primary tasks of any theory of labor market behavior must be the explanation of the compatibility of this absence with profit maximization. We can't blithely posit the replacement of "wage" competition by "job" competition and proceed from there.

CHAPTER 3

Segmentation Models of Labor Markets

The conventional view of labor markets emanates from neo-classical economic theory: in that formulation, labor is subject to the same economic laws as any other input in the production process, and the personal characteristics of all labor market participants are similarly subject to these same laws. On the demand side of the market, workers are hired up to that point where their marginal contribution to output is equivalent to the going wage. On the supply side workers are assumed to select that type and level of work effort that will maximize their welfare which in turn is assumed to derive from the pecuniary and nonpecuniary aspects of their work. The fact that these are suppositions of behavior rather than empirically derived relations means that much of the substance of labor market behavior is solved through assumption.

Even more important, the analysis is conducted at the level of the individual, focusing on individual choice of employment for the worker and marginal decisions of hiring for the employer. In addition, the presumption is that these choices and decisions are made on the basis of equal bargaining power. To the degree that institutions like labor unions or monopoly producers are recognized in this process, they are considered to be aberrations of normality which distort or modify but do not displace the basic tenets of the theory.

In contrast to orthodox models, segmentation theories are explicitly historical and focus on historical, systematic forces which restrict the options available to segments of the labor force. The primary unit of analysis is no longer the individual and his free choices, but rather groups or classes who face objectively different labor market situations which systematically condition their "tastes", and restrict their range of effective choices.

The orthodox models specify institutional parameters and then analyze the equilibrium which results from the choices of income maximizing individuals within those parameters. The segmentation theories attempt to explain the development of the institutions themselves as the result of interactions of groups or classes of individuals with objectively different interests; interests determined by the prior development of the institutions.

Segmentation theory therefore contests orthodox theory's assumptions that profit maximizing employers evaluate workers in terms of their individual characteristics and that all workers have a wide range of options among jobs and among different forms of training. To the contrary, segmentation implies that the labor market is fragmented into persisting groups, indentificable by rather permanent group characteristics. Those who fall into one or another of these groups have different patterns of work life which emerge not from individual choice or individualized employer evaluation but largely from the structure of the labor market for particular sets of jobs.

There are a number of variants of segmentation theory (we explain these below) which we designate by their respective authors--Piore; Gordon, Reich, Edwards. All of the variants hypothesize and try to establish that there are several types of jobs in the labor market each with distinct criteria for hiring and advancement, supervisory procedures, working conditions and wage levels, and each with generally different groups who fill the jobs. The distinct segments have been referred to as the "primary independent," "primary routinized," and "secondary" labor markets.

Jobs in the "primary routinized" labor market are characterized by relative job stability, relatively high wages, and wages rising with age (seniority). Primary jobs also tend to be full-time and full-year employment and are marked by promotion and wage patterns which are set internal to the firm. At the same time, we can locate the concentration of primary jobs in the ologopolistic industrial and transportation "core" of the economy as well as most office jobs and many jobs in the government bureaucracy. The general attributes of productivity on jobs in this sector are dependability, stability, responsiveness to authority and acceptance of externally set goals. The chief specific skills necessary for such jobs are best learned through practice and experience. There are well-defined promotional ladders in this sector. Access to entry level jobs on the ladders are determined by schooling, race, and sex which are seen as convenient indices of "stability" and other desired worker attributes mentioned above. [Piore's variant of the segmentation thesis concentrates on the trait of "stability," whereas Gordon et al. give weight to all four character traits (see Gordon, 1972, p. 4-48; Gordon, Reich, and Edwards, 1973b, pp. 361-3)].

Worker stability is encouraged by the seniority promotion system which regulates advancement along the finely differentiated job ladders. Gordon et al. also note that the job ladder structure limits workers' immediate mobility aspirations and legitimizes inequalities in authority and control (Gordon, Reich, and Edwards, 1973b, p. 364). Relative wages for different jobs along job ladders are defined by shop "custom" and don't respond to supply and demand pressures. Jobs in this segment of the labor force are often unionized, and the unions are frequently allowed to determine this relative wage structure in return for cooperation with management in disciplining and stabilizing the work force. The fixity of relative wages and the seniority-based promotion system also facilitate the transfer of valuable know-how from experienced to novice workers. More experienced workers don't fear competition from newcomers and are willing to pass along accumulated expertise to them.

The primary independent, or primary "creative," segment of the labor market includes jobs requiring creative, self-initiating action on the part of workers. Whereas jobs in the primary routinized segment require conformity to externally imposed norms, jobs in the independent segment require internalization of norms. The tasks performed in the primary creative sector have a large unique component so that they cannot be learned by simple repetition and practice. Formal training in deductive reasoning from abstract principles is the chief prerequisite for productivity in this segment. Therefore, a college or professional school degree is not an entrance requirement to almost all these jobs. Although there are job ladders within the segment, there is considerable inter-firm mobility--the labor market is often occupationally defined across firms, so that wages, allocation, and training decisions are controlled more by economic variables (external market) than administrative rules (internal market).[1] Individual motivation and achievement are highly rewarded, and work is judged and regulated by professional standards.

The secondary labor market comprises jobs requiring the least on the job training and the minimum of general skills. Jobs in this sector don't lead into promotion ladders, usually are not unionized, and offer low wages and poor working conditions. Supervision and firing criteria are arbitrary and vary with the whim of the manager or boss. The nature of tasks performed in this sector are very simple, requiring little or no general education or on the job training. The chief characteristic which distinguishes workers

1. Doeringer and Piore define the internal labor market as governed by administrative rules while the external labor market's pricing, allocation, and training decisions are controlled directly by economic variables. The two markets (internal and external) are interconnected and movement between them at certain job classifications which constitute "ports of entry and exit" and to and from the internal labor market. The internal labor market as an analytical construct depends on the rigidity of rules which define the boundaries of the internal labor market.

in this sector from workers in either of the primary sectors is a lack of stable working habits. This lack of stable working habits is both a consequence of the deplorable working conditions and lack of rewards for stability in the secondary labor market, and a motivation for employers in this sector to seek to design jobs which anyone can do with a minimum of experience and skill.

Thus far we have merely described the major characteristics of the various labor market segments. Each segment has its own characteristic entrance requirements, methods of work organization and control, reward structures and requires different character traits. Workers in the different segments display different types of work behavior, although we have not yet discussed the extent to which these behavior differences precede work experience or are merely a logical response to the different theoretical explanations to account for the origins and persistence of segmentation. It is important to untangle the various theoretical explanations of segmentation because they lead to different predictions about the potential viability of industrial democracy, and to the likelihood of its acceptance by corporate management.

Variants of the Theory of Segmented Labor Markets

We may divide the various explanations of segmentation into two groups--technological explanations and social control explanations. This dichotomy is somewhat problematic since all the variants of segmentation theory stress the interactions and reciprocal feedbacks between technology, organization of production and worker traits. However, some writers stress that technology has an inner logic, an inner dynamic of development which ultimately shapes and molds all other institutions of society to its own requirements whereas other theorists believe that the "logic" of technological development is logical only from the standpoint of solidifying the control of the upper echelons of corporate hierarchies over the productive process.

The most careful, most fully elaborated technological explanation of segmentation has been formulated by Michael Piore. Our discussion of the technological variant of segmentation theory will concentrate on his work. Piore summarizes his vision of the relation of technology, social and cultural institutions and worker characteristics as follows: "The roles of institutional forces and of labor force characteristics in determining market structure and played out within a set of technological forces which constrain and channel their impact....there is probably an elementary technological core to the economy which is impervious to assault by alien institutions and workers and will mold the latter to its own image before it gives way" (Piore, 1973b, p. 4). For Piore technological requirements shape the nature of jobs, and the requirements of jobs shape worker characteristics.

In Piore's view technological progress proceeds by the division of the work process into ever larger numbers of tasks and the substitution of mechanical power for human labor at those tasks. Piore explicitly argues that productivity rises monotonically as this division of labor increases and he even seems to imply that the motive force underlying technical change is the desire to increase productivity (Piore, 1973b, pp. 4-5, 7). Underlying both these assumptions is the view that "productivity" is a technological rather than a social relation. Given particular amounts and types of machines and particular levels of human skill and competency, a definite level of productivity more or less automatically ensues. It is precisely the rejection of this "automatic" view of productivity which distinguishes the social control variant of segmentation theory from Piore's version. We will postpone discussion of the objection to this assumption until we present the social control explanation of segmentation. For now we merely emphasize the pivotal position this assumption plays in Piore's theory.

Piore himself justifies the association of increasing productivity with increasing division of labor by reference to the classic arguments enunciated by Adam Smith over two hundred years ago (Piore, 1973b, p. 7). Specialization of tasks facilitates learning by doing, saves the time involved in moving from one task to another, and by focusing workers attention on a few tasks encourages them to invent time-saving innovations. To this list Piore adds that division of tasks permits the application of machines with more highly specialized functions which can operate faster and more efficiently. But though increases in the division of labor always increase productivity in a technical sense, the economically profitable extent of the division of labor is limited at any given time by the size, stability, and predictability of demand. The argument relating size of demand to degree of division of labor is straightforward and well known. Increasing division of labor decreases costs per unit, but only if large numbers of units are produced. If the market for the goods is small, the extra units will drive product price down to such low levels that the technically most efficient technique will no longer be profitable.

For the purpose of explaining segmentation however, the more relevant limits on the division of labor are those imposed by the stability and predictability of demand (Piore, 1973b, p. 8). Piore argues that the substitution of mechanical energy for human labor is an inherent part of increasing the division of labor. This implies an increasing amount of capital investment in physical terms and probably in value terms as well as per units of labor. Where product demand is unstable and unpredictable, entrepreneurs will be reluctant to undertake the risks associated with large capital investments. The potential losses from idle equipment will outweigh any gains from increased division of labor. Therefore in situations where demand is uncertain less capital intensive technologies will be used.

One could argue that the dichotomy between stable and unstable demand is too sharply drawn and that there is in reality a continuum running from relatively stable to relatively unstable situations. This would imply that there is a continuum of appropriate technologies ranging from very capital intensive, highly subdivided to labor and skill intensive technologies. But because of the great degree of interdependence in production between intermediate goods producers and users there are large economies of scale possible from standardization of capital goods. Therefore, there are "bunching" tendencies around the two poles of capital intensive and labor intensive technologies (Piore, 1973b, pp. 10, 17). In each industry a few large firms using large scale capital intensive methods will cater to the stable portion of demand, while a variety of smaller firms on the periphery of the industry will supply the unstable portion of demand. The precise methods by which the large firms "control" the stable portion of demand and "farm out" excess demand in boom times will vary from industry to industry and need not concern us here. The point is that the "bunching" principle will project the dualism within each industry onto the economy as a whole so that all peripheral firms will employ broadly similar technologies as will all large capital intensive firms.

To move from this explanation of product market dualism to an explanation of labor market segmentation, Piore introduces yet another dichotomy. He distinguished "task specific" from "task general" traits (Piore, 1973b, p. 20). The former set of traits consist of the ability to do particular tasks. Such traits are acquired through a process of "automatic, incidental learning," which occurs through watching others do the tasks and doing them oneself.

Thus the range of such tasks that one can perform depends chiefly on experience. Task general traits, conversely, consist of the ability to deduce from a set of general rules the appropriate behavior in particular situations. Task general traits are acquired through formal education and enable the worker to perform specific tasks never before encountered. In some cases, notably craft occupations, general traits are acquired through experience with a large variety of specific tasks. However, learning general traits through such a process requires exposure to a wide variety of situations, and thus would negate the benefits of specialization to a large extent. Therefore, this latter method of acquiring general traits grows less frequent as the division of labor advances, and today survives only in occupations whose methods have changed little since before the industrial revolution.

Piore argues that starting from a situation where all jobs are highly skilled the first stages in the division of labor separate out the most trivial tasks (Piore, 1973b, p. 26). The changes in technology necessary to do this involve little capital expenditure. Firms with small or uncertain product markets employ technology appropriate to this first stage in the division of labor. Jobs in such firms have either a very low, almost trivial skill level which requires very little experience and very little cooperating capital, or are managerial or technical jobs requiring task-general learning. Thus competitive firms generate both secondary and primary independent jobs. In large firms with stable product demand, the entire production process can be much more subdivided and routinized. Such firms employ a capital intensive technology in which most jobs are multi-task, semi-skilled or skilled jobs requiring task-specific learning. Since a worker's productivity on such jobs is a function of experience, these large firms have set up the internal labor market structures described earlier to encourage stability and promote the transfer of accumulated expertise from older to younger workers (Piore, 1973b, p. 28). The direction of technical change even in these large firms is, however, to further increase the division of labor, which implies continually decreasing the number of tasks per job. Eventually, all jobs in this sector except for a few highly skilled coordinating and managerial jobs will also become single-task, secondary market jobs. In fact, according to Piore many jobs in this sector are already objectively simple enough so that very little experience at them is required for high productivity, yet they continue to be part of the primary labor market because the institutional structure of unions and internal labor markets which were set up when the jobs were more highly skilled are hard to dismantle (Piore, 1973b, p. 30).

The other major theoretical explanation of segmentation is what we have termed the "social control" variant. The most explicit formulation of this theory is provided by Gordon, Reich and Edwards (GRE) (Gordon, Reich, and Edwards, 1973a, 1973b). The differences between their view of segmentation and Piore's derive largely from their rejection of his assumption that "productivity" is basically a technical relation determined by the amount and types of machines available. For GRE "productivity" is rooted in social relations, not in a technological relation. In fact, the development of technology itself is constrained by the need to reproduce the existing social relations of production. Those whose incomes and status depend on maintaining their control over the production process are interested only in technological changes which will tighten their control over production.

The basic social relation of production under capitalism is the relation of the laborer to the capitalist, which under modern conditions is embodied in the relation of labor to management. This is an antagonistic relationship although it is in the interest of management to represent it as a cooperative relationship in order to secure the cooperation of labor with management objectives. Seen from this perspective, labor market segmentation and the institutional structures of internal labor hierarchies have arisen during the last seventy years as a response of capitalists to labor unrest, and as an attempt to divide the workers and secure their "voluntary" acceptance of their status as wage-labor.

Specifically, GRE argue that during the nineteenth century technological progress and the increasing division of labor proceeded without segmentation of labor markets (GRE, 1973a). Indeed, increased mechanization of production undermined skilled craft work throughout this period and tended to create a homogeneous class of unskilled or semi-skilled labor. This tendency toward homogenization of the working class was also furthered by increasing factory size, the growth of a national labor market, increased residential segregation by income class, and the growth of trade unions (GRE, 1973a, pp. 45-54). These forces towards homogenization are not independent of one another. All derive ultimately from the requirements of the capital accumulation process and the extension of market relations. The emphasis in GRE's analysis is not on the interrelationships of these forces, but rather on their cumulative effect, which by roughly 1900 had reduced virtually all industrial jobs to the semi-skilled level. In other words, GRE assert that by the end of the nineteenth century the division of labor had already proceeded to Piore's theoretical final stage.

However, this "proletarianization" of the labor force led to proletarian consciousness and substantial labor unrest. The actual upsurge in labor conflict had begun a few years before the turn of the century (as early as 1877) and individual employers had already experimented with the tactic of playing off one emigrant group against another as a means of defusing strike activity, but systematic class conscious efforts to segment the labor force awaited the first decade of the twentieth century (GRE, 1973a, pp. 66, 68). The strategies of segmentation could not arise earlier because the large monopolistic firms had not consolidated their power. "Were it not for the new conditions of monopoly power which emerged during this period, corporations would probably not have had the freedom to devise new strategies for labor management...with the rise of monopoly power employers had the freedom to plan longer range strategies for institutionalizing internal and external labor markets." (GRE, 1973a, p. 70).

There is indeed some historical evidence that segmentation was a direct response to the need for social control in the factory, but a more general historical analysis of the division of labor in capitalist development puts the primacy of social control in doubt. There are several sources of difficulty. First, GRE uncritically accept Marglin's evidence that the form of technological innovation was determined by the need to strengthen capitalist control over production rather than by the need to increase technical productivity (Marglin, 1975). However, while the organization of work in the factory was probably partly a function of social control, there appear to have been other, much more important mechanisms which kept the worker in his place: for example, the abundant supply of factory labor in Europe in this period, the power of the state in protecting the rights of private property, etc. The overemphasis on technology (machines) as influencing the social relations in production draws attention away from the institutions of the system in which the machines are used. Indeed, there is historical evidence which suggests that the adoption of machinery was primarily the result of the production possibilities of the machinery.

A second difficulty with their interpretation of the historical data is that they have overdrawn the dichotomy between the "competitive" and "monopoly" phase of capitalist development. There may have been some "homogenization" of the labor force in the nineteenth century in the sense that former artisans and peasants now worked in the factory as workers; however, not everyone (particularly in the United States) worked in factories, and there was segmentation in factories in this competitive phase of capitalist expansion. Even in early textile mills in England, spinning and weaving machines were tended by a few skilled workers (usually former artisans) assisted by many women and children helpers. Moreover, the first unions both in England and the United States were organized by craft workers who thus separated themselves from the lot of the working masses.

GRE are correct, however, in asserting that the division of labor increased with monopolization of industry. Whether the increased division of labor and the formalization of distinct segments in the labor force is due primarily to the technology introduced in this period to increase production or whether it is due to the need for social control to maintain production and the relations in production is largely a matter of historical interpretation, given the present data. If we accept the GRE view that segmentation is a response to class conflict, with the form of the response determined by technology and requirements of the monopolistic form of production, we must be convinced either that increases in production could have been carried out with only small increases in the division of labor or that the division of labor could have proceeded without segmentation and hierarchization, if production had been worker controlled.

Unfortunately, it is precisely on the question of the historical relation of the systemic technological forces to the class conscious forces promoting segmentation that the GRE treatment of segmentation becomes vague and sketchy. They discuss the growing differentiation between "core" monopolistic firms and "peripheral" competitive firms in terms similar to Piore's. For instance, they relate stable product demand to high investments in capital and on the job training, and unstable product demand to low investments in both areas. On the other hand they also emphasize the greater ability of monopolistic firms to "pay off" unions and then pass along wage increases and other costs of internal labor markets in the form of price increases (GRE, 1973a, pp. 63-64). But the precise connections among product market dualism, the requirements of monopoly capital, and labor market segmentation are never spelled out. Moreover, their treatment of the relation of these technological forces to the "conscious" forces promoting segmentation is never clearly explained. We learn only that "These sources of segmentation, although relatively independent historically, both emerged from the dynamics of monopoly capitalist development from the end of the nineteenth century...While one cannot directly explain the primary segmentation process characterizing recent American economic history by a simple application of these two threads of monopoly capitalist development, they combined in subtle and concrete historical ways to condition these developments (GRE, 1973a, p. 54).

While the GRE analysis of the origins of segmentation is not as tightly woven as Piore's we think that their related discussion of the functions and mechanisms of segmentation forms a much richer tapestry. Segmentation results not solely from the interplay of blind technological forces, but also from the conscious desires of managers and capitalists to maintain control over the labor force and the production process. It achieves this result by dividing the workers, placing them in objectively different, and frequently antagonistic relationships. For instance, workers in the primary independent market are frequently used to control workers in the others both indirectly and directly. Technicians design the machines and calculate the "efficient" rate of speed for the workers as well as directly supervise production. Seen from this perspective, the high general education requirements for entrance into the primary independent labor market are due to the need for a separate socialization process so that workers in this sphere will identify with management and not with other workers. Piore's technocratic explanation that high general education requirements reflect the comparative advantage of schools over experience in teaching "general traits" occupies at best a subordinate place in GRE's arguments. Similarly, whereas Piore views the internal labor market as an allocative compromise which satisfies management's interest by reducing training and turnover costs, and satisfies labor's interest in job security and equitable advancement procedures, GRE note that the hierarchical structures of job ladders legitimize the larger inequalities in authority and control between bosses and workers and limit workers' immediate mobility aspirations. The fact that management often allows the unions to regulate advancement and relative wage structures increases the legitimacy of those hierarchies and gives the most powerful elements in the unions a vested interest in excluding questions of control of production from collective bargaining. GRE might also mention but don't, that specialization of tasks and rigidly structured job ladders keep workers ignorant of the production process as a whole and thereby limit demands of the rank and file for control over production. Finally, in the GRE view the confinement of the majority of blacks and women in the secondary labor force is due not so much to the "less stable" work behavior of these groups as it is to the need to further legitimize labor market segmentation by making it correspond to larger lines of segmentation to deepen conflicts within the working class. GRE also emphasize that the role of institutions of socialization in this context is to perpetuate the expectation that blacks and women will hold subordinate positions. To the extent that this socialization succeeds in reconciling these groups to secondary labor market status, they accept the conditions of employment in this sector with less protest than white males would.

Nevertheless, there are a number of conceptual difficulties with the GRE model as well as problems with empirical verification of important elements of that variant of segmentation (see below on empirical results in the U.S.). This led us to develop our own segmentation model, a model which we think is more consistent with the historical development of the labor-capital conflict, particularly in the United States (see Center of Economic Studies, 1976, Chapter 4). In our version of the segmented labor market, the "primary independent" occupational segment remains essentially intact as the "high education" segment, similar across industries in the kind of characteristics it requires of workers and the rewards paid to those characteristics. But the "primary subordinate" segment as such does not exist in our model. Unlike the high education segment, which is populated in the private sector largely by white males, the primary subordinate segment is so varied in its character--from well-paid jobs in a highly structured internal labor market to many "dead end" jobs--that our empirical results (below) showed, for example, important differences between the treatment of blacks and women in that market and the treatment of white males. A historical analysis points to the division of primary subordinate workers into those working in organized "union" jobs, which are also usually jobs in monopoly industries, and those workers who are not organized and usually in competitive industries. Finally, we have brought the "secondary" occupational segment together with that part of the primary subordinate segment which is not unionized to form the "competitive" segment.

While this "new" segmentation model seems more plausible for analytical purposes than Piore's or GRE's, it is no more than another conceptual construct within the framework of segmentation models of the labor force. As with other constructs, it has its problems. In our view these problems are fewer than the "technological" or "social control" variants of the model and thus gives us more consistency with the dynamic of capitalist development.

This development, as GRE argue, has created a segmented labor market structure in which different groups of workers from *distinct social and economic class backgrounds* characteristically occupy the different segments. In each segment there are many concretely different jobs, but the different jobs within a segment possess all or most of a distinctive set of entrance requirements, promotion possibilities, wage levels and working conditions which set them apart from jobs in other segments. Taken together the distinctive characteristic work and employment structures in each segment imply that the social relations under which workers in the different segments labor are qualitatively different and require different levels and types of skills, values and attitudes.

A Proposed Model of Segmentation

Our view of segmentation, based on the concepts of contradiction, correspondence, and the centrality of work processes assign theoretical primacy to the basic *contradictions* in social structures. The specification of these contradictions involves analyzing the interactions of technology, workplace social relations, and *class-based* worker characteristics. None of these factors is assumed dominant or ultimately determinant in isolation from the others. We suggest that the broad changes in the technical and social organization of production in the last century in the U.S. and Europe had the effect of dividing the job structure into four segments or clusters of jobs. As in other segmentation models, each segment has different characteristic wage levels, entrance requirements, promotion patterns, and is characteristically staffed by workers from particular class, sex, and racial backgrounds.

There is a relatively well paid segment of jobs requiring high levels of general education that cuts across both competitive and monopoly sectors of the economy. Technical change constantly creates new jobs within this segment, but at the same time eliminates or simplifies many jobs formerly requiring high education. There is job competition on an individual basis within this segment but the high education requirement has until recently restricted access to this sector to males from middle and upper class backgrounds. Secondly, there is a monopoly segment characterized by unions, internal hierarchies, and relative job security for employees with seniority. Although the jobs in this segment do not necessarily require more experience or education than jobs in the competitive sector they are more highly paid than those jobs because workers in this sector have historically been able to capture some of the gains from increased labor productivity which mechanization has brought, and have been able to maintain their resulting differentially higher wages through a variety of nonmarket mechanisms which have restricted the entry of lower wage labor. Thirdly, there is a competitive segment characterized by the lowest wages, least steady employment, and poorest working conditions and advancement opportunities of any of the segments. This segment comprises not only jobs in competitive firms, but also clerical jobs in monopoly firms. These latter jobs developed only with the growth of monopoly and mass production itself, were from the outset separated from production jobs in the monopoly sector, and were never the locus of struggle by a previously entrenched group of workers. Hence the clerical occupations were from the outset able to recruit low wage labor. Jobs in the competitive segment are overwhelmingly staffed by women, minority group members and other relative newcomers to wage labor. Finally, there is a dwindling crafts segment comprised of jobs requiring traditional manual skills that can only be learned through lengthy practical experience.

Craft workers are largely organized in craft unions, which through licensing and certification procedures attempt to restrict competition for members' jobs. Craft workers are located in both the monopoly and competitive spheres, and many craft workers are self-employed. Craft workers are relatively highly paid and exercise more autonomy over their work activities than any workers except those in the high education segment, but technological advances constantly undermine the need for craft skills.

These differences in social relations among the various segments imply that different sets of skills, values, and attitudes are relevant to productivity in the different segments.

Orthodox models of labor markets generally assume that wages equal productivity; therefore, the relationship of worker characteristics such as education and age with earnings (which we use in our empirical analysis below) represents a relation between worker attributes and worker capacity to produce. The level of wages and the return to additional education and experience in work reflects workers' marginal product and the marginal product of more schooling and more time on the job. The firm pays workers their product because of competition in the job market for workers by employers and by workers for jobs.

But, as we have argued, this notion is a theoretical, not empirical construct. There is no convincing way to verify that wages equal productivity across jobs or firms producing different products.[2] It is observable that people with higher education and experience receive higher wages, and we should infer that unless employers are completely irrational or maximizing something other than output, that there is some correlation between productivity, education and experience. Yet, this correlation does not have to be the same as the correlation between wages, or earnings, and those worker attributes. Neither does the correlation between wages and productivity have to be the same across all occupational groups, as the orthodox model suggests. We already know from numerous studies that the relation of education and experience with earnings is different for different sexes, races, and occupational groups.

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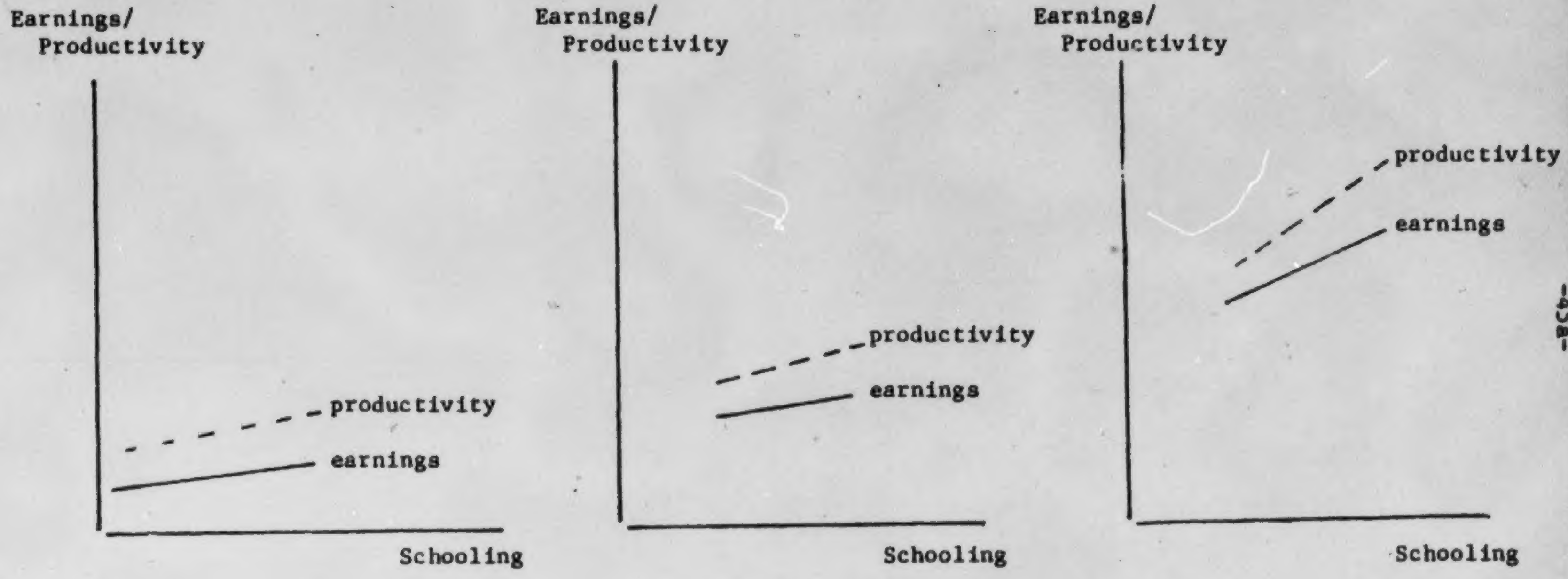
[2] Lester Thurow did use an aggregate production function (for a discussion of the problems associated with such functions see Blaug, 1975) to estimate that wages are less than marginal product for American workers (Thurow, 1968).

In the human capital model, the existence of discrimination or "differential treatment" is an anomoly inconsistent with the neo-classical theory. In our review of "social control" variant of the segmentation model, however, differential treatment is part and parcel of the extraction of surplus value from labor. Employers will always pay labor less than its marginal product if they can, and unlike the neo-classical view of the firm and labor markets, in the radical analysis of those institutions the bargaining between workers and employers is not among individual equals. Even though the small firm owner may not see himself as more powerful than workers, the technology developed by larger capitalist firms and universities is constantly saving on labor and attempting to make complex, skill requiring tasks into simpler, semi-skilled tasks. This helps create a surplus labor situation for jobs in which labor shortages exist. Furthermore, other institutions of society, such as the ideological apparti of schools and media are heavily supportive of capitalist hierarchy in production.

In Figure 1, we show a hypothetical relationship between productivity, wages, and education. In the "lowest" labor market, we show productivity at a lower level than in the next highest and the highest labor market. The slope of productivity with respect to education is more complex. Workers in the lowest level occupations have less schooling on average than workers in the higher segments (Carnoy and Rumberger, 1976). So the issue is whether

Figure 1

A Model of the Earnings/Productivity - Schooling Relation by Labor Market Segment



Competitive Segment

Unionized Segment

High Education Segment

the relationship between productivity and, say, schooling has a greater slope at lower levels of schooling than at higher. On the one hand, we would think that the early years of schooling would produce the greatest productivity increases because the cognitive and non-cognitive knowledge taught in those years is so fundamental to the industrial produiction process (Inkeles and Smith, 1974). On the other hand, higher years of schooling use more resources (more teachers per pupil, higher capital investment per pupil, and higher product foregone per pupil), so that the increase in productivity per year is greater. We have drawn the slope of the productivity-education line as higher in the higher segments without being convinced that it should logically be that way.

The distance between the productivity and earnings lines are the most important aspect of our analysis. Unlike the other versions of segmented labor markets--which have emphasized the different slopes of the earnings-worker characteristics relation for different types of jobs--our analysis of the historical evolution of the wage-labor relation in capitalist development leads us to focus on the productivity/earnings differential in different labor markets. In the segmented labor market models we have reviewed, the extraction of surplus from labor hinges on "controlling" workers by dividing them into different kinds of tasks, separating one kind of worker from another, etc., and motivating some workers through job ladder promotion incentives, while letting others work in a much more traditional insecure job market. Implicit in these models is, among other things, a differential slope of earnings/education-experience.

In our model, the more important point is that the creation and maintenance of a reserve army of unemployed labor in some labor markets enables employers to extract more surplus from workers than in labor markets where either workers have organized (and been recognized as) unions or where skilled labor is still necessary for production and is in relatively short supply. As we shall discuss, however, capital owners are always in the process of reducing skilled into semi-skilled labor through technological change, thus attempting to spread the productivity-earnings gap in the higher segments. As the model stands here, the relative productivity-earnings gap is greatest in the "competitive" segment, smaller in the unionized segment, and smallest in the "highly educated" segment. There is some evidence from Thurow (1968) to support this configuration: we find the difference in earnings-productivity is smaller in the more unionized manufacturing sector than in the economy as a whole.

Thus, we would not only expect to find wages lower in the competitive segment, but lower for a person with a given amount of schooling and experience and lower relative to productivity. In addition, we make the education-earnings slope lower in that segment than in higher segments to conform to previous conceptions of segmentation and to our empirical findings. Overall, then, a person in the competitive segment averages lower earnings for a given amount of education and experience than in the unionized segment and those earnings are lower relative to productivity than in the unionized segment. According to our model, the primary extraction of surplus therefore occurs in this competitive labor market. Nevertheless, because of the monopoly pricing which characterizes the unionized segment it is possible that Thurow's estimates are incorrect and that despite higher earnings in the monopoly segment, monopoly firms are able to extract greater (or as great) surplus from unionized labor as from those workers in the competitive segment. Finally, we show that in the higher educated segment, the slope of earnings/education is greater than in the lower two segments, largely because of the relative shortage of workers in the highest educated groups and the higher cost of higher education compared to the lower levels of education attained by those workers in the lower two segments.

Of course, it is difficult to test the validity of this model because of the near impossibility of measuring the crucial difference in productivity/earnings in the three segments. But the construct is useful because it stresses the role of a reserve army of unemployed and the reduction of skilled labor to semi-skilled through the increasingly complex division of labor. The model also indicates that an increase in the size of, say, the higher education segment relative to the competitive segment would imply the necessity for capitalists/managers to increase the extraction of surplus labor from that higher segment because the size of surplus potential in the lower segment would be declining. Indeed, as we argue below, one of the most important features of developed country labor markets in the last decade has been the gradual transformation of the high education segment.

There are some data which indicate that the levels and slopes of the earnings lines we have drawn are generally correct, and that important differences in income for similar occupations do exist between the unionized/monopoly segment and the competitive segment. Using the results of our empirical analysis of the segments as defined in the "social control" variant of segmentation (which has some overlap with the segments as defined in our model), we see that salaries are considerably higher for both blacks and whites, men and women, in the non-competitive private sector than in the competitive (Table 1). However, for white males, who in 1970 occupied more than 80 percent of the primary independent (or high education) jobs in the private sector, according to our data, the difference in earnings between competitive and non-competitive industries is very small. This is what our model would predict.

But there are important problems with our model as we define the segments. First, although women and blacks with high school or more are

TABLE III-1

United States: Means and (Standard Deviation) of Annual Earnings by Occupational Segment, Race, and Private/Public Sector, Males 1970 (Dollars)

	Secondary/Secondary		Primary Subordinate/ Primary Subordinate		Primary Independent/ Primary Independent	
All Black Males*	4,185	(2,806)	6,064	(3,448)	7,864	(6,555)
Private Employees	4,095	(2,735)	6,015	(3,414)	7.867	(5,440)
competitive/competitive[a]	3,707	(2,687)	5,591	(3,534)	6,921	(5,453)
noncomp./noncomp.[a]	5,777	(2,255)	7,427	(2,738)	9,900	(4,980)
Public Employees	4,999	(2,851)	7,129	(2,734)	11,107	(5,011)
All White Males*	5,690	(4,092)	8,135	(4,887)	10,715	(10,590)
Private employees	5,872	(4,142)	8,521	(4,438)	14,088	(10,076)
competitive/competitive[a]	5,297	(3,757)	8,272	(4,744)	13,775	(10,777)
noncomp./noncomp.[a]	7,667	(4,905)	9,337	(3,786)	14,502	(8,485)
Public Employees	5,670	(2,745)	8,282	(3,949)	12,130	(5,584)

Source: United States Department of Commerce, 1/1000 Census Sample, 1970.

* Includes self-employed

a. industry in 1970/industry in 1965 - Note: the Census does not distinguish between private and public sector industry classifications in 1965 but this distinction is made for industrial classification in 1970.

much more likely to be in the competitive than in the unionized/monopoly segment, and this in part explains their lower salaries, women particularly in all three of our defined segments receive lower salaries than white males. As we pointed out, women serve as a reserve army even in the higher education segment. The fact that they have an alternative occupation (housewife), even though non-payed, keeps them out of the ranks of the unemployed when unemployment is high (they return full-time to housework) and draws them into the labor force when the market is tight. This means that special conditions affect the earnings/education-experience relations for women which are different than those for men because of the particular situation of women in our society, a situation which conveniently makes their labor lower priced for owners of capital with no evidence that their work is characterized by lower productivity.

Second, although we would expect that there would be little pay-off to additional experience and education for primary subordinate workers in competitive industries (previous configuration) and high salary pay-off to these workers in non-competitive industries. This would be the closest comparison we could make using the estimates we made based on the occupational/industry segments and the new configuration we propose. However, even though the reward to some years of college education is much higher in non-competitive industries for white male primary subordinate workers (Carnoy and Rumberger, 1976, Table 15), otherwise the estimated functions for those white males are very similar, a finding which does not support our model, since there is a high correlation between unionization and location in non-competitive industries.

With these problems in mind, we now turn to the nature of the segments as we have redefined them in high income, industrialized economies and the analysis of worker characteristics associated with each segment in that context.

The "High Education" Segment

This segment comprises jobs for which at least a college education is required as a prerequisite of employment. Managerial/administrative jobs, technical/scientific jobs, and a variety of professional services, are the major types of jobs included. Until quite recently the costs of higher education excluded all but the relatively economically privileged from access to this sector. This defacto elimination of competition from low wage labor combined with the strategic importance of such jobs to the profitability of individual capitalist firms has meant that this sector has historically enjoyed higher wage levels and greater employment security than any other segment.

In our earlier discussion on the historical development of labor process structures as developed in the "social control" variant of segmentation we noted that technological change and increasing division of labor have occurred under capitalism in a form which concentrates responsibility for design, planning and management of production in relatively few jobs. This concentration of knowledge, planning and organizational responsibilities in a relatively thin strata of jobs is the basis on which the "high education" segment and its particular institutional features rest. In particular, it must be remembered that this concentration of thinking and decision-making in a few jobs corresponds to the removal of these functions from all other jobs, and especially from traditional skilled labor jobs. Planning is separated from execution. The actual component tasks of production are subdivided, simplified, and routinized as much as possible in order to speed up production and permit substitution of lower wage, less skilled labor.

This separation of planning from execution means that employees in the high education segment must in the course of their work make decisions which intimately affect the daily lives of the masses of workers engaged in actual execution of production even though they have no practical experience of laboring under the technical and organizational conditions which their decisions jointly create for these workers. Moreover, they must make these decisions so as to increase the profitability of capital, even where this goal conflicts with the concrete interests of workers in job protection, satisfying work, etc. This requires an ability to reason from general economic, technical, scientific and managerial principles to detailed applications of those principles in specific contexts so as to serve the interests of capital. This ability in its turn presupposes highly developed cognitive abilities such as skills in symbolic manipulation, deductive reasoning, verbal facility, etc., as well as familiarity with particular bodies of technical and professional knowledge and details of the firm's operation. But on top of these it requires an internalization of the goals and values of corporate capitalism. That is, an employee in the high education segment must identify his (her) interests with those of capital rather than with those of labor, despite the fact that he (she) is formally a wage laborer.

This identification need not be self-conscious. Indeed employees in this sector need not be aware that there is a conflict of interests between capital and labor or that their work often serves the interest of the former at the expense of the latter. They may well imagine--and it is a major aspect of the socialization they have undergone in college to inculcate this belief--that science and technology are value free, neutral and promote progress for all. Or again they may scarcely think about such issues at all, but confine the use of their critical facilities to perfecting the operation of whatever department they are located in, so as to increase their chances for promotion. However they rationalize or represent their activity to themselves, the point remains that their jobs involve such detailed and complex knowledge of particular aspects of production that top management cannot directly supervise all their actions. Therefore, employees in this sector must understand the firm's goals and be competent, willing and even eager to take the actions necessary to fulfill those goals. Indeed, in order to rise to the pinnacles of success within this sector an employee must subordinate not only the needs of production workers, but even personal and family needs to the pursuit of corporate profitability goals.[3]

An additional implication of the separation of planning from execution and the concentration of the former functions in a relatively few jobs, is that the decisions and activities of these job holders affect the entire conditions of labor of a large number of workers (or students in school becoming workers), creating the potential for large swings in aggregate productivity and profits of the firm. Even where high education employees work outside production departments of firms (e.g., in advertising and promotion departments) their decisions crucially affect profits realized by the individual firm even though they don't directly affect productivity.

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[3] A high percentage of women and blacks (and also a significant percentage of white males) employed in high education jobs--approximately 50 percent--are employed in the public sector. And of those employed in the public sector, about 60 to 70 percent of the high education blacks and women are employed by local government. The attributes of high education workers applies to these public sector employees, except that there is much more indirect contact with production workers for many high education public employees (however, high education employees working in public hospitals or city government, for example, are in a similar position to those working in a private company). Nevertheless, even though there is no direct relation to profitability goals in the private sense, public high education workers have to have particularly strong internalized capitalist goals in order to be trusted with the development of worker characteristics for the production structure (teachers and school administrators), and to manage public services in ways which make them compatible and not competitive with private production and consistent with capitalist profitability development goals (see Carnoy, Girling, and Rumberger, 1976); Gintis, 1975).

Because the decisions and actions of even a single employee in this segment can have such substantial direct and indirect effects on profits, individual ability and skill differences are directly rewarded in terms of wages and promotion opportunities. Although wages rise regularly with seniority on these jobs, there is substantial competition among firms for employees who perform exceptionally well, and younger employees are regularly promoted past older employees whose productivity has peaked. Thus in this segment the power, income and status of an individual are closely linked to the firm's profits; a circumstance which solidifies the identification of the worker with capital's interests. The wage structure itself is relatively fixed and not responsive to minor changes in the supply of qualified employees. Since these jobs are critical for profits, it is much more important to get and hold someone "good" in the job than it is to pinch pennies on wages.

In sum, employees in this sector have the most autonomy, the highest pay and the most job security of any group of workers in the economy. Although there are substantial individual differences in income and power within this segment and there is considerable competition among workers for the more important, more well paid jobs within the segment; the relatively privileged position of the group as a whole contributes to a strong sense of identification with the profitability goals of the employer, and with the general principles of division of labor, hierarchical control of production, and private property.

Before closing this section we should mention that at present the circumstances which have underlain the relative privileges and job autonomy of the high education segment are dissolving. Namely, the principles of separation of planning from execution are increasingly applied to "brain" work as well as manual work, and intellectual work itself is increasingly subdivided into relatively routinized tasks requiring a high level of general educational background but little job specific experience and which involve only minor or moderate individual responsibility for capital value.[4]

The "Unionized Segment"

This segment comprises jobs where unionization or the threat of unionization has secured for the workers a set of structures which regularize the employment relationship; restrict competition among workers within the segment and from workers outside the segment. Jobs in this segment are located almost entirely within the sphere of large scale, capital-intensive production, and are concentrated in the industrial and transportation core of the economy. A variety of craft jobs organized on a craft union basis are located in competitive sectors of the economy. They survive, however, only as relics of a bygone era. Advances in mechanization and division of labor have eroded the need for traditional craft skills wherever they were an important factor in production costs. Through severely restrictive entry provisions in their charters craft unions have restricted the supply of craft skills and maintained relatively high wage levels for their members. Indeed, their relatively high wages, combined with the retention of autonomy and decision-making power over details of the work process inherent in the skilled nature of their work establish craft workers as an "elite" among the working class.

However, as discussed above, the thrust of capitalist development has been towards routinized, simplified jobs organized in large scale, capital intensive production processes with highly developed, detailed divisions of labor. In the process most groups of workers with traditional skills have had to ally with less skilled workers in their respective industries in order to protect their relatively high wages from erosion through competition with lower wage labor. The resulting industrial unions, more broadly based than craft unions, but still representing only direct production workers and excluding most secretarial, sales and other "white collar" office workers, have largely accepted technologies and divisions of labor which routinize and simplify work in return for a share of the productivity gains made possible by the introduction of those technologies and for structures which regularize the employment relationship for a stipulated period of time. We discuss these structures, their consequences for social relations on the job, and their implications for socialization below.[5]

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[4] Teaching in primary and secondary schools is an excellent example of a high education job which is systematically being reduced to simpler components through programmed workbooks and, in some cases, educational media. Attempts were recently made (they failed) in California to evaluate teacher performance (and salary) on student performance goals set out by higher management and production norms, while initially to be set by teachers themselves, constituted a step toward guaging teacher performance as production workers rather than managers.

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[5] The implications for socialization which we derive in the following paragraphs are based on logical inference from analysis of the social relations inherent in the structures in the unionized, monopolized sector of the economy. Where such structures exist without formal unions or with company unions, the implications for socialization derived here are valid. This corresponds to the fact that the social and economic backgrounds of the labor force employed in jobs covered by such structures are broadly similar. Thus we include in the "unionized" segment, jobs where union pay scales, and characteristic union-type job structures protect jobs and regulate advancement even though no union is present. Nonetheless, it must not be presumed from this that the dynamics of capitalist accumulation and development will affect the unionized and non-unionized portions of this segment similarly. For example, a large portion of state jobs have seniority structures, levels of job protection, and salary levels broadly similar to those in the unionized sector. The work though lighter and requiring slightly higher levels of general education is as routinized as work in the unionized sector. Thus, in many respects the socialization required to allow production to function smoothly is similar in both contexts. Yet we expect workers in the state sector without formal union legal structures, without as yet a tradition of union struggle, and located more remotely from the centers of society's material reproduction to encounter even more difficulty sustaining relative wage levels in the coming decades than will workers in the capital intensive monopolized, unionized sector.

A central unifying feature of jobs in the unionized sector is that their content can be more or less routinized and codified in a set of rules and standard operating procedures. Moveover, jobs in this sector are finely subdivided components of large processes. While there are some jobs which involve individual operation of large machinery and thus retain some scope for individual feelings of mastery and accomplishment, many more are repetitive assembly line tasks. By their very nature, therefore, these jobs afford the worker little intrinsic satisfaction. The motivation to perform them must come from outside the job; from its circumstances rather than from its content. The major "circumstance" rendering work in this sector tolerable is, of, course, the relatively high salary levels. These are still on the average below those of the high education sector; but for levels of education through junior college, jobs in the monopolized unionized sector pay relatively better and afford more stable employment than jobs in the competitive sector. There are also established productivity and working condition standards on unionized jobs to protect against arbitrary dismissal or speed up.

An additional circumstance distinguishing jobs in this sector from those in the competitive sector is that the former are arranged in finely graduated pyramidal hierarchies and hold out the promise of regular advancement with seniority, while the latter have severely limited promotion opportunities. Jobs higher in the hierarchy not only have higher pay, but also typically require less physical effort or less constant concentration and give the worker more autonomy over his actions on the job. Jobs higher in the hierarchy also typically involve more responsibility for capital value and may require slightly higher levels of skill, but this latter is not a necessary condition. The major point is that jobs higher in the hierarchy are more desirable on virtually every criterion. Access to these coveted jobs is determined generally on a seniority rather than on a productivity basis. Nevertheless, a regular high level of productivity must be maintained on jobs at the lowest level of the hierarchy if the employee is to attain seniority. This scheme holds out to the worker the promise of relatively easy work at increased wages in the future only if he/she works hard, follows rules and doesn't "rock the boat." Although management must pay higher wages to those few workers at the top of the hierarchy than it would if workers were allowed to compete for these jobs, it more than recovers these losses in terms of increased productive effort and reduced hostility on the part of the bulk of the workers who are located in the more alienating, more exploited jobs at the bottom of the hierarchy. Viewed from the management perspective, these promotion patterns and relative wage structures constitute a sophisticated mechanism for extracting a regular high level of labor from the labor force, while at the same time sustaining the appearances of equal opportunity and self determination. Viewed from the labor perspective these structures offer some degree of job protection and security and prevent competition among workers from pushing up productivity standards and contributing to speed up.

The major productivity attribute required on jobs within this sector is the capacity to carry out a set of instructions to the supervisor's satisfaction. Beyond basic literacy and numerical skills there are few cognitive abilities required on these jobs. However, workers in this sector must be disciplined and responsive to authority. To be hired permanently, a worker must come to work every day, be able to carry out tasks within the assigned time, and accept task assignments without question. Although jobs in this segment frequently involve task specific skills, these can typically be learned with one or two months' practice. Work is supervised, regulated by established norms and standards and often machine paced. Worker responsibilities are geared to direct work objectives. The worker in this segment does not have to internalize responsibilities to the firm, nor understand, nor value firm profitability goals to be productive. But since the nature of highly subdivided industrial processes involves high degrees of interdependence between the various component tasks of the process workers must be reliable, steady performers. For this reason as well as to evidence average learning ability, a high school diploma (and increasingly some junior college experience) is being required for entry into this sector.[6]

On the other hand, "too much" education is a liability in the unionized sector. A high level of education is likely to render the work even more stultifying and boring than otherwise, and is likely to be associated with greater ambition for upward mobility and new experience than the fixed seniority systems in this sector can accommodate (Quinn, 1976). A capacity to transfer ambition outside the job, to sublimate personal job satisfaction for the sake of external material rewards is rather what is required on these jobs. Since the routinized, circumscribed nature of such jobs precludes the realization of intrinsic satisfaction from the work itself, workers will continue to perform acceptably in them only if they feel they need the high wages which the jobs provide in order to maintain a fulfilling consumption standard during their "leisure" time.

The "Competitive Segment"

The competitive segment of the labor market comprises jobs which lack highly specialized skill or special education requirements, and on to which structures to control entry and competition among workers are

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[6] Unions also have an interest in requiring some educational credential for entry into the sector, as this requirement helps to keep the most disadvantaged, low wage labor out and thus helps to prevent erosion of wage levels.

largely absent. These same circumstances combine to create low wages and unstable working conditions in such jobs. That is, lower and more unstable than in the other segments discussed. Protections against arbitrary dismissal at the whim of the supervisor are generally absent. There are seldom standards to protect the worker against speed up, forced overtime, etc. Basic health and safety standards are often non-existent or not observed. The instability of competitive firms in which most of these jobs are located imply that periodic layoffs and unemployment are an endemic feature of work in this sector. However, beyond these general negative conditions of employment there is a great diversity of concrete work situations.

For example, the concentration of jobs in this sector is in competitive industries and service occupations with low capital intensity and labor productivity, but many secretarial and retail sales positions located in monopoly firms have decidedly lower pay and less security than jobs in the unionized production departments of those firms. Some work in this sector is menial and requires no education, not even knowledge of English (busboys, farm laborers). Other work in this sector requires a high school diploma, proficiency in English grammar and vocabulary, and competence in several manual skills (secretaries). Most jobs in this sector are "dead end" jobs with little or no provision for upward mobility, but a few allow a particularly talented and ambitious individual employed by a prosperous firm to carve out a niche for him/herself and become virtually indispensable to the firm. (e.g., Certain waitresses or secretaries attain this status and can then bargain individually for wage/working condition packages that equal those normally attainable in the unionized sector.) Thus it is not so much the technical details of the work--not even its character as mental or manual labor--that unify this segment, as it is the low pay, unstable employment, and unregulated working conditions which characterize it.

Given these characteristics of jobs in the competitive segment of the labor market only those workers who have no other employment opportunities, but who must still work to live will accept employment in this segment. Workers without at least a high school diploma, workers with a high school diploma who have been denied entry into the unionized sector by discriminatory regulations and practices, young workers waiting for an "opening" in the monopolized, unionized sector, or workers who either desire or are constrained to less than full time work comprise the overwhelming majority of workers in the competitive segment of the labor market.[7] Workers who fall into one or another of these categories are not just a random sample of the labor force, but are disproportionately comprised of identifiable groups within it. In particular, women, blacks, Chicanos, Puerto Ricans, illegal aliens, and workers from impoverished rural backgrounds are largely confined to this segment, and compose a large percentage of its work force over twenty-one years of age. (Teenagers who work are almost exclusively confined to employment in the competitive segment, regardless of race, sex, or socio-economic background, and teenagers from minority groups are frequently unable to find employment at all.)

Because of the generally undesirable working conditions in the competitive segment, and because of the "low station" of those jobs, it is important for social stability that workers in the segment see this situation in individual rather than structural terms. That is, they must locate the reason for their restricted set of employment opportunities in individual lack of ability or bad luck rather than blaming "the system." Otherwise, not only will they be as individuals more refractory to discipline and harder to manage on the job, but as groups they may become sufficiently alienated to rebel or embrace anti-capitalist ideologies.

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[7] In the early 1960's, about 45 percent of the U.S. labor force was part-time or part-year, and most of these were women, blacks, and young white males (Morse, 1969).

The competitive segment, then, is a low skill, generally low education market. Although dependability and discipline are desirable and may command a slight wage premium even in this market, employers must take what they can get and depend on tight supervision and the threat of dismissal to extract labor from their workers. In a real sense, submissiveness and passivity are the traits most characteristically required by such jobs.

Critiques of Segmented Labor Market Theories

Two major published reviews of the dual and segmented labor market literature have been written by neo-classical economists. Both criticize the methodological and empirical foundations of the dual segmented view of labor markets.

In the first of these, Michael Wachter (1974) concentrated his analysis on the "technological" dual models of Doeringer/Piore. Harrison, Vietorisz, etc. He argues that the dual models contribute to some aspects of understanding the workings of labor markets, but that, in general, they do not form an acceptable alternative to neo-classical formulations. Specifically, he finds the dual model deficient on the following grounds:

1. In his opinion, the dualists interpret the internal (primary) labor market as operating largely without regard to efficiency (in other words, workers are not paid on the basis of merit or productivity but rather on grounds of seniority or other non-"profit-maximizing" criteria). But Wachter suggests that the internal labor market is "best viewed as an efficient institutional response by firms to the basic market imperfections

arising from the costs of information and of specific and on-the-job training" (Wachter, 1974, p. 678).

2. He argues that a strict dualist division between primary and secondary sectors is not supported by the data. The "small amount" of mobility between sections is not defined. The expected distribution of income under a dual version of the labor market would be bimodal, and mobility between the secondary and primary sectors would be limited; neither of these, according to Wachter, is observable. On the other hand, he agrees that labor market segments exist (with imperfect mobility between them), but that this segmentation is based largely on human capital differences between workers (supply side differences) emphasized in the neoclassical model.

3. He contends that the dualist view of underemployment in the secondary sector is an article of faith, empirically untestable, and one with which he fundamentally disagrees. The underemployment hypothesis contends that workers in the secondary sector are potentially skilled enough to function in the primary sector (given the usual training), but are prevented by discrimination, imperfect information, and the failure of primary firms to adjust their job structures in response to the availability of good workers. Furthermore, secondary workers--once relegated to "bad" jobs in the secondary market--become "bad" workers, which creates an endogenous barrier to mobility. As Wachter correctly points out, this is a crucial element in both the dual and segmented labor market theories, particularly from the policy standpoint. In his view, workers in the secondary market (low-paying, high-turnover jobs) are in those jobs because they are harder to train and less productive (this is the human capital approach). Thus, moving them into the primary market would require much higher training costs than if they were kept in the secondary market largely

by institutional barriers. Not only that, but--as we discuss below--simply providing more primary jobs as a solution to poverty and underemployment would either not work (employers would not hire secondary workers) or would be highly inflationary (for example, if the public sector intervened by creating primary jobs).

4. Wachter agrees that the "feedback" mechanism introduced by dual labor market models; i.e., the alteration of workers' behavior patterns in response to the type of jobs they work in, is a useful construct in understanding labor markets. However, he feels that such feedback means that workers really _are_ different in the secondary and primary markets and that secondary and primary workers are not substitutable. It would be expensive to train secondary workers for primary jobs specifically because the training must overcome negative signals about work from the past.

5. He contends that the observed instability, low wages, and frequent short spells of unemployment associated with secondary jobs in the 1960's may be in large part associated with the increased share of 16-24 year-old workers in the labor force, and this is, in turn, due to demographic facts such as the post-World War II baby boom. If this is the case, we should expect a significant decrease in the problem as the age composition of the labor force in the U.S. shifts upward over the next generation. Monetary and fiscal policy designed to increase economic growth and capital accumulation should therefore have more favorable effects on alleviating poverty in the future, and it is on such increased economic growth rather than the creation of primary jobs _per se_ that policy should focus.

In commenting on Wachter's paper, Piore points out that neo-classical theory is essentially "a story about a world in which technology and tastes are given" (Wachter, 1974, p. 685). Therefore, Piore continues, dual labor market theory does not argue that the firm operates inefficiently or that management fails to minimize costs; yet, when tastes and technology "are made endogenous to the economy, the term 'efficiency,' as it is understood in neo-classical theory, loses its meaning" (Wachter, 1974, p. 685). From a segmented labor market view, the firm is being efficient, even from a profit-maximizing standpoint, when it chooses so-called non-productivity criteria for promotion in internal ladders. For the monopoly firm, as GRE argue, long-run work place stability and peace have much greater production and efficiency implications than the individual "productivity" of individual workers. Therefore, using seniority criteria for promotion to easier, higher paying jobs on the same job ladder may be an acceptable selection criterion from the workers' point of view, while formal education criteria, even though they may have much less to do with productivity than the wage differentials they come to represent, may be acceptable to workers as a selection procedure for different kinds of jobs within the firm. Keeping the peace through such sanctioned divisions and selections among workers may have much more important profit-maximizing implications than productivity losses from using non-merit or quasi-merit criteria from promotions and division of labor. In addition, Wachter does not speak to the issue of employers' need to control the decision-making processes in production and the implications they might have for the meaning of "efficiency" in production.

The issue of the role of "feedback" and its effect on policy also seems to be confused by Wachter. He states that feedback models are important and empirically verified but that they "do not support the conclusion that better jobs, rather than better training, are the answer to the low-wage problem. They do suggest, however, that manpower training of adult workers is likely to be a costly process, which must remedy not only deficiencies in past education, but also the negative signals that the worker has received from society" (Wachter, 1974, p., 663). But if workers' behavior as workers is conditioned by the work they do, how can that conditioning be overcome without first changing the conditions of work? How can workers be convinced that the signals have changed without actually first changing the job possibilities confronting secondary workers? Why would Wachter believe that high cost manpower training would solve the problem of poverty and overcome past signals if the structure of demand for labor doesn't change? Quite to the contrary of Wachter's view, it seems that the provision of an increased number of primary jobs is a necessary precondition to the success of any manpower training programs.

Cain (Cain, 1974; Cain, 1975) raises a similar set of objections to the dual-radical (D-R) models, but focuses more on defending against the challenge they pose to neo-classical labor market theory. In essence, he contends (like Wachter) that DR explanations are not really alternative theories and that their contributions to the understanding of labor markets can be incorporated into the neo-classical framework. Specifically:

1. Like Wachter, Cain argues that there is no evidence of bimodal or even multimodal wage distributions and that there has been no definition of "a small amount" of mobility between sectors. He believes that mobility between sectors is high and that the wage distribution is normal.

2. He admits that continued wage and job discrimination has not been adequately explained by neo-classical theory, since in the neo-classical model, discrimination should get increasingly less as a result of competitive forces in product and labor markets. However, Cain feels that the stress of neo-classical economists on pre-labor market sources of the disadvantages for both blacks and women (which reduces the burden of explaining market discrimination) is more persuasive than the D-R models of "exploitation, employer strategies of dividing and conquering their work force, or self-perpetuating and viscious circle theories" (Cain, 1975, p. 21). Wachter

concurs with this preference, arguing that the quality of education variable, not included in most studies of discrimination, may do much to explain wage differences between blacks and whites. But Cain and Wachter's preference for supply side (human capital) explanations of discrimination are not based on the empirical success of neo-classical researchers; these two analysts are simply not convinced that the failure of neo-classical theory to deal adequately with pervasive differences in earnings between various groups in the economy is due to a theoretical failure, nor are they convinced that the D-R arguments for institutional (demand side) discrimination are persuasive. In any case, Cain cannot resolve this neo-classical dilemma. The issue of demand (labor market structure) versus supply (individual characteristics) effects on wage differentials in the labor market is not only crucial to explaining discrimination but changes in income distribution (Carnoy, 1975) and employment (Carnoy, 1976).

3. The D-R models imply that the roles of monopolies, unions, and other sources of protected labor markets are so pervasive in industrial economies that the empirical work of orthodox economists based on the assumption of competition are untenable. However, Cain contends that this issue is almost entirely one of the empirical frequency, duration, and importance of these imperfections, and that, in fact, neo-classical economists have used these ideas in studying the effects of unions on wages and employment.

4. Finally, Cain (as well as Wachter) raises the point that in dividing workers into different segments and testing whether the human capital variables have a small or zero effect on earnings in the secondary market, the D-R researchers are truncating the dependent variable (wages), and so independent variables like years of schooling or experience are clearly biased toward zero.

These are all important points, but aside from the empirical issue of the mobility between segments (which we deal with in the next chapter), they do not deal adequately with the challenge posed by segmented labor market theory. The last point is a good example: Cain is certainly correct in stating that the truncation of the dependent variable will reduce the coefficients of independent variables such as schooling, etc. But the question is: Why would the coefficients be reduced more in the "lowest" labor market than in the highest? Why could schooling have a positive and large effect on incomes in primary independent jobs and a small effect in secondary jobs? For, those in the primary independent jobs are also a "select" group--highly successful in this case. We deal with this empirical issue in the next chapter.

Much more important, however, is Cain's rejection of any theoretical base for the segmentation model. While he acknowledges the materialist dialectical basis for the radical version of segmentation theory, he contends that "The exposition of these theories are stronger in their criticisms of neo-classical theory than they are in advancing a coherent replacement." Cain apparently forgets that neo-classical theory, couched in the notions of utility theory, equilibrium (as developed by Whitehead, Marshall, Fisher, Walras, and others), and the theory of the firm, was itself in large part an intellectual response to Marxist theory. Furthermore, Cain does not deal at all with the historical controversy with regard to capitalist development and labor markets as discussed by the radical theory of segmentation (GRE, 1973). To argue, as Cain does, that the issue of wage rigidities and protected labor markets is "almost entirely one of the empirical frequency, duration, and importance of these market imperfections" (Cain, 1975, p. 21), reflects his unwillingness to take seriously that historical discussion. The radical interpretation argues that monopoly capitalism and the role of the State in capitalist societies are not aberrations of competitive capitalism, but part and parcel of capitalist development. Further, the relations between capitalists (employers) and workers are set in the context of the historical development of capitalism, and that this development can be described by the conflict between capital and labor. The issue here is not whether monopolies employ more or fewer people than competitive firms at a point in time, but whether the history of capitalist development in a given country is marked by increasing or decreasing monopolization of capital, and what effects those changes have on the labor market. Cain gives this theoretical alternative short shrift. In his interpretation, it is not a "persuasive" alternative to the neo-classical model although he never explains why he favors one over the other (in the longer version of his paper (Cain, 1974), he devotes less then two pages to Marxist theory). This implies more than agreeing or disagreeing on the empirical evidence, particularly econometric evidence; it implies agreeing on the theoretical base on which to judge that evidence (or at least recognizing that different legitimate theoretical bases exist for judging evidence). Piore comments on this point in the following way:

> I do not want to ignore the econometric evidence; but I am much more likely to infer from that evidence that I got the structure wrong or that they got me wrong than that the labor market structures I have talked about have no reality and do not require an explanation. Often the econometric evidence is made the central issue in debates on this area (although it is by no means unambiguous taken even on its own terms). I don't think we would have any real difficulty agreeing on what exists and what needs to be explained. Our disagreement is really theoretical. (Wachter, 1974, p. 685)

With that view in mind, we now turn to the econometric evidence on labor market segmentation, first in the United States and then in lower-income countries.

CHAPTER 4

Econometric Studies of Segmented Labor Markets in the United States

There have been a number of attempts to test empirically the existence of segmented labor markets in the United States by the use of cross-section/longitudinal data on individuals. The principal hypotheses tested in these studies are whether there is significant mobility between segments, whether human capital variables are important in explaining mobility between secondary and primary segments, and whether there are significant differences in the contribution of human capital variables (including education and experience) to within segment mobility (wages or income) in different segments.

Each one of the four studies reviewed here uses a different sample of the United States population and three different definitions of labor market segments. Nevertheless, their conclusions are not very different: there is substantial mobility between segments, especially among young people; minorities have less mobility than whites; it is difficult to explain the causes of inter-segment mobility, so even though workers in secondary jobs have less education than workers in primary jobs, education does not seem to be the key factor keeping people in low-paying work; and the pay-off to human capital is less (even negligible) in the secondary market than in primary subordinate or primary independent jobs.

The Ohio State Sample

Paul Andrisani (1973), using data gathered by Herbert Parnes and his associates at Ohio State on a sample of 14-24 year-old males not enrolled in school and with no more than twelve years of school, interviewed in 1966, 1967, and 1968, estimated: a) the degree of movement between secondary first job and "intermediate" and primary jobs in 1968; b) the relation between likelihood of primary first job and human capital, socio-economic status, mental ability, and other independent variables; c) the relationship between secondary/primary mobility and human capital and other independent variables, and d) the relationship of wages to human capital and other independent variables. In all these, separate estimates were made for black and white males.

Andrisani found that there was a large amount of movement from secondary first jobs to primary jobs in 1968. Of the young white males in the sample who had secondary first jobs, only 19 percent stayed in those kinds of jobs, while 20 percent moved to intermediate and 60 percent to primary jobs. Of the young blacks in the sample, about 38 percent stayed in secondary jobs, 20 percent moved to intermediate jobs, and 42 percent to primary jobs. Despite the important race differences in mobility, even for blacks, mobility could not be said to be restricted. Nevertheless, in trying to explain the likelihood of a first job in the primary segment and secondary to primary mobility, the results are much less clear: Andrisani concludes that whether either black or white males get a primary first job is largely "random;" that is, the independent variables he uses explain less than five percent of the variance in the probability. Educational attainment is significant for whites but not blacks, while mental ability is significant for blacks but not whites. Similarly, in explaining mobility, human capital variables (educational attainment, training, and mental ability) are not significant for either race. Marital status seems to be important in explaining white mobility but not black. Finally, Andrisani found some support for the hypothesis of non-competing groups in his estimates for wages. There were substantial intercolor differences in the criteria used to allocate better paying jobs. For whites, family social status, marital status, education, and age were all significant factors in wage determination in both primary and secondary jobs. For blacks, first job status and educational attainment were significant in the primary labor market, but only marital status and graduation status (whether a person graduated secondary school or not) were significant in the secondary market.

The difficulty with Andrisani's results is the relatively small size of his samples, particularly in secondary jobs (82 whites and 77 blacks), and his definition of job segments. He essentially defines the division into labor markets as the median income in 1959: those in occupations with median earnings greater than or equal to the median of the entire male labor force and in an industry with median earnings of at least $4,303 (these industries employed 2/3 of the male labor force in 1959) were defined as in the primary market, and those in occupations with median earning below the median for the entire labor force and in industries with median earnings below $4,303. Clearly, this definition makes it much more likely that there will be large movements between secondary and primary jobs, since what is measured is movement between occupations below median earnings to occupations above the median. It is not unusual either that Andrisani's independent variables did a poor job of explaining what may be nothing more than an upward drift in jobs as young workers gain experience in the labor market. Despite this, Andrisani does find noteworthy inter-racial differences in mobility and wage determination.

The Survey of Economic Opportunity

Paul Osterman (1975) tests only the third of the three hypotheses: do earnings functions differ significantly between different segments of the labor market? To perform this test, he used the data on male workers in the 1967 Survey of Economic Opportunity (SEO), dividing individuals into each of three segments -- secondary, lower tier primary and upper tier primary. But his division is open to serious question: he apparently used personal judgment to place each five-digit occupation into the proper segment. In Osterman's study, the secondary sector contains occupations characterized by low wages, instability of employment, and similar factors, and within the primary sector each occupation was assigned to the upper or lower tier on the basis of the autonomy and personal participation enjoyed by workers in that occupation (Osterman, 1975, p. 513). Even though there is a high degree of correspondence between the upper tier and the high end of the Duncan scale (Duncan, 1961) and the secondary segment and the lower tail of the Duncan scale, Osterman's segmentation results in almost 90 percent of the sample of 4,600 male workers falling into the lower tier of the primary sector. Only 234 workers are classified as secondary and 242 as upper tier primary. This conflicts with the notions of the secondary labor force as "lower class," the lower tier primary as "working class," and the upper tier primary as "smallish elite of the middle class" (Osterman, 1975, p. 511). Piore and Gordon's concept of the "new working class" belonging to the upper tier or Gans' concept of the "professional upper middle class" (Gans, 1962) would probably involve closer to 10 percent of the male labor force, while the lower class of male workers would probably come closer to 20 percent of workers rather than the 5 percent classified secondary by Osterman.

In any case, Osterman estimated earnings (annual earnings) as a function of years of schooling, age, race, weeks unemployed, hours worked, and the industry worked in. He finds that in the secondary segment, only time worked has significant coefficients; that is, education, age, and even race has no significant effect on earnings (when blacks and whites are separated, however, Osterman finds that years of schooling is significant in the black equation, with a coefficient larger than in the estimated equation for blacks in the lower tier. Meanwhile, the estimated equations for the lower and upper tier of the primary labor market indicate the significance of all the variables in the lower tier equation (with time worked having an important positive effect on earnings) and education and age significant in the upper tier equation, but race not significant and hours worked with a significant negative effect on earnings. Furthermore, the age and education coefficients in the upper tier equation are larger than in the lower tier.

Although Osterman concludes on the basis of these results that "the findings of the study strongly support the dual labor market theory," and that "the human capital model holds up very well for upper tier workers but has little explanatory power for workers in the secondary labor market" (Osterman, 1975, p. 520), the way in which he divided his sample into segments casts considerable doubt on his results, particularly in the secondary segment. Furthermore, by using years of schooling as a linear variable in his equation, he does not differentiate between the different levels of schooling which are entering into the equation for each segment. Thus, in his secondary market, there are probably very few workers with more than high school education, and in his upper tier, there are few workers with less than some college education. Nevertheless, Cain's and Wachter's point that truncating earnings would bias education coefficients to zero in the secondary market -- while certainly applicable to Osterman's analysis -- should also affect the upper tier sample, since that group is also very select. Clearly, the education variable is highly significant in the latter, while it is not in the former, tending to lend support to Osterman's conclusions about the relative effect of human capital at the lower and higher ends of the occupation spectrum. The lower tier group, however, is so large and varied that it should not be compared with the other two.

Large City Low Income Areas

Samuel Rosenberg (1975) did not deal with earnings functions; rather, he attempted to test a number of hypotheses about the behavior of secondary and primary labor markets, including the determinants of a worker's initial job (primary or secondary) and the mobility between job segments. The individuals studied are males 21-64 years old, living in low income areas of Brooklyn, New York (5031 cases), Cleveland (1838 cases), Detroit (2085 cases), and San Francisco (1496 cases), surveyed as part of the 1970 census. One of the most important contributions of Rosenberg's study is his definition of job segments. He relies on Robert Lucas' study on working conditions, wage rates, and human capital (Lucas, 1973), which links the Dictionary of Occupational Titles (DOT) job classification system of about 10,000 occupations with the Bureau of the Census classification system of about 200 occupations (1960). Lucas' work made it possible to take DOT job characteristics, such as training time (specific vocational preparation), education required, hazards associated with the job, and the relationship to people (supervising, instructing, taking orders, etc.). Rosenberg used the characteristics of the 1960 occupations and applied them to 1970 occupations (which were more finely broken down than the 1960 occupations). He then defined secondary jobs by the low specific vocational training and general educational development required to do the job, as well as the low pay and the temperament (ability to take direct orders) a worker must have to do the job satisfactorily. Primary jobs are taken as those jobs which are not secondary.

Rosenberg's definition of secondary jobs is therefore much more carefully specified than in other, previous studies. His results show that secondary workers "exhibit higher turnover than primary workers though the differences are not as great as was expected given the heavy emphasis on turnover in the writings on the dual labor market. Primary workers are more prone to work a full year than secondary workers. However, the average job tenure of secondary workers is quite lengthy. The results on turnover suggest that only a small part of the secondary labor force exhibit the instability associated with secondary work while other workers in the same occupations do not" (Rosenberg, 1975,

p. 166). Further, he finds that white secondary workers have shorter job tenure than blacks, while the opposite holds true for workers in the primary market.

In three of the four cities, black workers were more likely to remain in secondary jobs than whites, and for those workers -- both blacks and whites -- who start out in primary jobs, there is a 70-80 percent probability of staying there. But the chance of both blacks and whites who had their first job in the secondary market to move into the primary is generally greater than 50 percent, although the probability is higher for whites than for blacks. Whether this is high or low mobility is hard to say, although it shows that the barriers separating primary from secondary jobs -- if they exist -- are certainly not impermeable.

As far as the determinants of having a primary first job, Rosenberg finds that educational attainment plays a very important role in first job determination, a much stronger role than in current job determination. This, he argues, is consistent with dual market theory which predicts that a worker's experience becomes increasingly important in determining future jobs as his career progresses. Education is significant in determining primary current job as well, but if first job is included in the estimate, the effect of education declines markedly. In other words, education operates through first job, and then first job affects current job. Nevertheless, the effect of first job on current job is not nearly so strong as dual market theory argues. As Rosenberg points out, this result, along with the mobility figures discussed above, show that barriers between the two markets are certainly not airtight.

The mobility between secondary and primary markets is found by Rosenberg to be significantly affected by years of schooling, although the evidence is not strong enough to argue that the reason people are locked into secondary jobs is because of lack of education. Training is not significant in explaining mobility, but in some cases migration is. The effect of labor force experience is also quite small, which is consistent with the dual labor market hypothesis that increased experience in the secondary labor market should not lead to upward mobility.

Rosenberg's results on migration seem to support our formulation of labor markets developed in Chapter 3. He finds that many of the recent migrants to Nothern labor markets from foreign countries, as well as blacks and some whites, recently arrived from the South, are presently in the secondary labor market. Rosenberg argues -- on the basis of his results -- that "A more accurate picture of the secondary labor market is as a reserve labor force to the primary sector . . . [the dual labor market] does not consist of two sectors between which mobility is impossible . . . In times of tight labor markets, some secondary workers get pulled up into primary jobs. To some degree, those who are upwardly mobile have more human capital than those who are not . . . When labor markets loosen, many of these people return to the secondary market . . . The secondary market is constantly being replenished by migrants from the South and rural areas. This source of secondary workers is supplemented by minority workers immigrating from foreign areas such as Mexico and other parts of Latin America, Asia, the Caribbean and Puerto Rico. When these foreign workers are no longer needed, many are sent home." (Rosenberg, 1975, p. 170).

The 1970 U. S. Census

The last of the U.S. empirical analyses of segmented markets we summarize here was carried out at the Center for Economic Studies in 1975 and 1976 (Carnoy and Rumberger, 1976; Carnoy, Girling, and Rumberger, 1976). For our data, we used the 1/1000 Public Use Samples of the 1960 and 1970 U.S. Censuses. The 1970 Census contains information on both the current occupation and industry worked in for each individual and the job and industry in 1965, five years previous. The advantage of these data is the large sample size, general coverage of the labor force, and the possibility of testing mobility between types of jobs and types of industries (the latter not covered by either Rosenberg or Osterman, for example). We were much more careful than Osterman or Andrisani in developing job segments consistent with the criteria developed for those segments by various versions of the theory, much in the line of Rosenberg's work. Also, the size of the sample not only permitted division of the analysis by race (which seems to be crucial to segmentation in the United States) but by sex and by public and private sector of employment. Heretofore, empirical studies have dealt only with male workers (even though almost 40 percent of the labor force in 1970 was female), and had not distinguished between private and public sector employment.

In our study, we first deal with the issue of mobility between segments of the labor market. Second, we try to explain economic position within segments (as reflected by earnings) of the market among those who stay in each segment over a five year period. According to segmented labor market theory, once someone enters a particular type of work or a particular type of industry, or is born into a particular race of sex (a) movement between one segment of the labor market and another segment is limited, and (b) economic position within a given segment of the labor market for that person is treated in the labor market differently from the way he or she would be treated if he or she were in a different part of the labor market. From the standpoint of an individual, therefore, the observable phenomena of segmented labor markets are limited mobility and differential treatment.[1]

We divide labor markets in four ways: by race, sex, type of job, and type of industry worked in. In the first division we divide races into blacks and whites, putting to one side a small minority of Americans who are nonwhite but not Negroes. We divided types of jobs into four occupational segments: secondary jobs, primary subordinate jobs, primary independent jobs, and crafts. Finally, we divide industry into public and private sector and private industries into "competitive" and "noncompetitive."[2]

It should be obvious that mobility between labor markets defined for different race groups or sex groups is virtually impossible since it is difficult to change one's race or sex. Thus for black male/white male segmentation, we were primarily concerned with intra-segment economic position which we defined by annual earnings. However, for different types of occupations and different types of industries, we were concerned with the determinants of both inter-segment mobility and intra-segment position, as well as the absolute amount of both.[3]

Specifically, the hypotheses we tested were the following:

1. Mobility between occupational and industrial segments is limited for both blacks and whites.

2. The mobility which does occur is random; i.e., it does not follow any pattern predicated on individual characteristics of those who move and don't move.

3. Age-earnings profiles for blacks and whites in secondary occupations are flat (no significant increase in earnings with increased age) while there are significant increases in earnings with increasing age in primary subordinate and primary independent jobs (internal labor markets).

4. Similarly, in competitive private industries, age-earnings profiles are flat, while in noncompetitive private industries, there are significant increases in earnings over working life.

5. In secondary jobs, increased education is not rewarded, while in primary jobs, particularly primary independent jobs, it is.

6. Employers do not seek stability of employees in secondary jobs and in the competitive private sector, since secondary jobs or jobs in the competitive sector tend to be more temporary; thus stability is not rewarded by additional earnings.

Mobility Between Occupational and Industrial Segments

The first hypothesis we test with our data is that there is limited movement over time between different segments defined by occupation and type of industry. The 1970 census data asked not only respondent's present occupation and industrial sector worked but what occupation and industrial sector the respondent worked in five years ago. Our results show (in agreement with Rosenberg's) that black males are less upwardly mobile from secondary jobs (24.1% vs. 39.8% for white males) and more downwardly mobile from primary independent jobs (22.0% vs. 13.1%). Although all those who start out in primary subordinate jobs tend to be relatively stable in those jobs, the pattern of mobility from primary subordinate jobs is different for blacks and whites: black males have an especially high tendency to downward mobility from primary subordinate jobs to secondary jobs (9.1% vs. 5.2% for whites) while while males have a tendence to upward mobility from primary subordinate to primary independent (8.4% vs. 2.9% for blacks).

What are the implications of these figures? They show that white males, for example, have much higher upward mobility out of the secondary labor market than do blacks. This means that if a black male is working in the secondary labor market he has a greater likelihood of remaining in his secondary job than does a white.

Once we divide the total groups by age, the differences become much more striking. The percentage of young white males who stay in secondary jobs is very low. Among those who were 20 to 24 years old in 1970, the differences in the percentages of whites and blacks who start in the secondary labor market and who stayed there is large, and the difference persists, growing significantly smaller only among workers older than 35 to 44 years old. In essence, this means that the first job in a secondary labor market for young whites, particularly young white males, appears to be a temporary situation. For blacks, it is much more likely to be a permanent situation. This also means that the first job would probably not be a very good indicator of future occupation for young whites but is a much better indicator of future occupation for young blacks.[4]

On the other hand, the opposite appears to be true for those who start out in primary independent jobs. Young black males, 25 to 34 years old, have a much higher downward mobility than young white males. Thus, for young males in higher occupation positions the first job is a much better indicator of future position for whites than for blacks, just the opposite of the condition which seems to prevail in lower paying jobs.[5]

Among those women who were in the labor force in the two years[6] both blacks and whites were less likely to move into a higher segment of the labor force than were corresponding race males, while those white women in higher segments were more likely to move into lower segments than white men.

There is an additional dimension to the downward mobility of black males and women in primary independent jobs: in all groups, those employed in the public sector had much higher stability in primary independent jobs than those employed in the private sector. This difference was particularly striking for blacks.

Turning now to mobility between industrial sector segments, we estimate that for both black and white men and women there was less movement from the private competitive to the noncompetitive industries than from the noncompetitive to the competitive over the five years period. However, blacks had somewhat less sectoral stability than whites. Sectoral stability in general is "high", with only about 10 percent movement up to the noncompetitive and 15 percent down to the competitive among all occupation groups in the five year period.

What Explains Mobility?

Upward mobility from lower to higher level occupation segments does yield higher incomes and seems to be based in part on the higher education of those who move. The reason for the income difference between the competitive and noncompetitive industrial sectors is less clear, particularly for whites, and having moved from a competitive industry to a noncompetitive industry does not seem to yield higher income for white males even though the average education of those who moved is higher: those who stayed in the competitive sector on the average receive higher earnings than those who moved. This seeming contradiction occurs probably because those who changed sectors are younger on the average than those who stayed in the competitive sector. For blacks, however, those who moved from the competitive to noncompetitive sector received higher incomes and had higher average education.

Now, what are the correlates of mobility between occupation segments and between the competitive and noncompetitive industrial sectors for black and white men and women? Although we can explain only a small percentage of the total variance in movement from the occupational or industrial sector segment to another, it is clear from our regression estimates that schooling and age are significant correlates of upward mobility for both blacks and white men and women when the least-squares estimation is used.[7]

Being married for a man means greater probability of moving to a higher segment, but for women, the opposite is true even for those who have been married and are heads of household. In the neo-classical model, the explanation for this is that employers consider women to be greater risks in more responsible jobs or that married women are willing to work fewer hours per week or fewer weeks per year so cannot become eligible for the more stable primary subordinate or primary independent jobs. But in the segmentation model, it might be explained by employers being able to keep women with higher education and experience (with supposedly higher productivity) and married in lower level (and lower-paying) jobs without losing them to competing firms because married women (perhaps needing the income more or perhaps needing it less) are more reluctant to move (either from insecurity of losing a job or because they lack motivation to look around).

We might also hypothesize that there is greater mobility from secondary to primary subordinate jobs in competitive than in non-competitive industries, where advancement ladders are more structured and rigid, and divisions in production more hierarchical. Indeed, we find that secondary/primary subordinate mobility is lower in noncompetitive industries for white males but the age and education pattern of mobility is very similar in private industry as a whole and the non-competitive sector. (32.4 percent moved in competitive vs. 21.4 percent in noncompetitive).

What do our results imply? For one thing, we can explain only a small percentage of the variance in whether a person moves from one segment (as we have defined it) of the labor market to another, but there are patterns of mobility that may be affected by schooling variables, age variables, and whether a person is married or not. For certain movements -- like from the primary subordinate to primary independent segment -- other factors, such as attending college five years ago while in the labor market produces an "artificial" type of mobility, which is largely the result of a temporary stay in one type of occupation while going to college, when in fact, upon finishing college, the person enters the primary independent segment.

Thus we can say that, although we can explain only a small percent of inter-segment movement, mobility is not completely random, and even though more limited for certain groups than others and for those in certain labor markets more than for those in others, having less than average schooling clearly lowers the possibility of mobility while having more than average schooling seems to increase it. Furthermore, mobility follows well-defined patterns through age. Being black or Mexican-American definitely means lower upward mobility and higher downward mobility but being in the public or private sector does not seem to make much difference when other factors are accounted for.

Mobility Internal to Different Segments of the Labor Market

Do different segments of the labor market treat various characteristics of workers differently? The theory of labor market segmentation, as we have already discussed, defines different types of segments: 1) occupational segments; 2) industry segments; 3) segmentation by race; and 4) by sex. Our analysis tested whether those who stayed in secondary occupations between 1965 and 1970, primary subordinate occupations, and primary independent occupations had different earnings functions, and whether those who were employed in competitive industries had different earnings functions from those employed in noncompetitive (concentrated) industries.[8] We tested these differences for whites and blacks and males and females separately, which allows us to compare the treatment of the same individual characteristics in the same segment for different races. Finally, for white males we test whether earnings functions differ between competitive and noncompetitive industries for each occupational segment. Thus we are able to test the hypothesis that in each occupational segment schooling and age are rewarded differently in different types of industries -- that internal labor markets dominate concentrated industries but not competitive industries, particularly in the secondary and primary subordinate occupational segments.

Occupational Segments

The division into occupational segments turns out to be a division highly correlated with the average level of workers' schooling. Even though we did not use schooling as the basis of the division into segments, more educated workers tend to be in the primary independent jobs and workers with little education stay in secondary jobs. We therefore do not have a wide representation of education levels for each occupational segment; rather, the low levels of education dominate the secondary and primary subordinate segments (very few observations with higher than completed high school) and high levels of education dominate the primary independent segment. Only in primary independent jobs do we have a fairly wide spread of education, since older workers in those jobs have lower levels of schooling.

The results of our estimates generally support the claims of segmentated labor market theory that in secondary jobs, additional experience (as represented by age) does not increase a worker's earnings beyond a very young age. When other variables are taken into account, earnings in secondary jobs stay flat from the late twenties to about sixty years old for black males and to about fifty years old for white males (they drop thereafter for both groups). Being young means getting significantly less income, but the difference is lower for blacks than for whites. On the other hand, getting more education (completing high school rather than not completing) makes a difference for whites even in this labor market, but not for blacks. Only those blacks who have no high school education at all get paid significantly less than high school graduates. But vocational training (specialized training) is also rewarded in the secondary sector, especially for blacks.[9]

Our variable which measures whether a person is married or has been married is important since it relates to stability factors in the secondary labor market as well as to the kinds of characteristics which are rewarded in that segment of the labor market. In the case of white males there is a relatively high payoff to being married or having been married as opposed to being single, taking account of age and education, and amount of time worked and sector in which worked. For black males, the coefficient of being married is also large and positive but is reduced more sharply than for white males by including weeks and hours worked in the regression. Thus although being married does have a significant direct positive earnings effect for black and white men (weeks worked and hours worked held constant) being married also has a significant effect on the amount of time worked in the year for blacks. For example, a black male married in 1970 and in the secondary labor market worked an average of four weeks a year longer than his single counterpart and a black male who had been married worked 2.5 weeks a year more than his single counterpart. In addition, the married male worked three hours more a week than the single counterpart and a black male who had been married worked two hours more a week than his single counterpart, although the latter coefficient is not significant.

For women, the situation is more complex; in some segments, like the primary subordinate, married women living with their husbands earned less than single women living alone or with other wage earners. In other segments, like the secondary and primary independent, married women generally earned the same or more (if they were acting as heads of household) than single women. In higher level jobs, women acting as head of household -- corresponding to the traditional male role in the U.S. middle class family -- received a higher salary parallel to the higher salary received by married males in that segment.

The estimate that married male workers and workers with vocational training earn more in the secondary labor market raises some serious questions about the instability assumptions for the secondary labor market. A number of authors, among them Gordon, Edwards, and Reich (1973a), have argued that an important characteristic of secondary jobs is their instability, based on the desire of employers to have unstable labor in those jobs which tend to be temporary.[10/] The fact that employers want these kinds of workers in secondary jobs, they argue, results in a self-fulfilling prophecy: workers who remain in a secondary labor market take on personal characteristics which correspond to this desired instability. Thus they content that secondary market workers tend toward unstable work habits because this is the kind of behavior which is demanded by the labor market in which they work.

The relatively high payoffs to being married and to vocational training casts some doubts on this assumption. First of all, if we assume that employers want unstable workers, then we have to ask why they are apparently willing to pay more for married workers and for vocational training in this labor market. On the one hand, married workers are generally considered to be more stable, in the sense that because of economic necessity, they are probably less willing to lose their job. On the other hand, if married workers need a job more than unmarried workers, they should be more easily exploited by employers and they should therefore be paid less. Those who are vocational trained should also be more stable since they somehow were stable enough to receive the training. Since none of these hypotheses seem to be empirically verified by our sample data, we have to conclude that married and vocationally trained workers somehow are either in a stronger bargaining position, other variables held constant, or the traits associated with being married or trained are more valuable to employers than those associated with being single and untrained, or that "custom" which dictates that married and trained workers should be paid more than unmarried and untrained workers holds even in the secondary labor market. We tend to think that married workers are driven by economic necessary to want to work longer hours and more weeks a year, but the fact is that they also seem to be able to get paid more on the average even when these longer weeks and longer hours are accounted for.

As segmented labor market theory predicts, education and age have a more significant relation to earnings in primary subordinate and primary independent than in secondary jobs (in the case of black men and women in primary independent jobs, the size of the sample is so small that we have statistical significance problems, although the behavior of the education coefficients is the same as for white men and women).

The principal difference between the male and female regressions estimates for each segment lies in the absolute size of the coefficients or schooling and age: women not only receive lower salaries than men, they generally get a lower pay-off to additional schooling and higher age. There are exceptions to this, such as in the primary independent segment, where white women, largely employed in the public sector, have higher -- in absolute terms -- coefficients for graduate education than do white males.

Perhaps the most interesting result in our analysis is that the average level of earnings and the earnings function for black males in primary subordinate jobs are similar to the average earnings and the earnings function for white males in secondary jobs. The principal differences are in the pay-off to being married, which is much higher for white males in secondary jobs, and in the role of the public sector, where black males receive significantly higher salaries in primary subordinate jobs (as well as secondary and primary independent) but white males in secondary jobs receive insignificantly lower salaries.

This result can be interpreted to mean that black workers even in primary sector jobs face labor market conditions characteristic of the secondary labor market for whites. Of course, one could also argue that the only "true" secondary labor market for males is the one faced by black males in secondary jobs. But given our result that black workers in primary subordinate jobs and white workers in secondary jobs have, on the average, low earnings (about $6,000 annually in 1969), a variation of only 8 percent in average earnings from age 29 to 59, and a low pay-off to taking additional schooling both in high school, but especially to years beyond high school, we contend that these are characteristics of secondary labor markets, albeit that the labor market faced by blacks in secondary jobs are even more extreme in these same characteristics.

Industry Segments

According to the theoretical explanation of industrial segmentation developed in the introduction to this study, competitive industries should prefer a less stable, more temporary labor force, and noncompetitive industries, a more stable, permanent force. Thus we would expect: 1) a much greater fraction of the labor force in competitive than in noncompetitive firms to be in secondary jobs and to be black and female, and 2) those workers who are in primary subordinate jobs, to have earnings functions which are closer in appearance to secondary earnings functions (low correlation between age or education and earnings) than internal labor market promotion-type functions.

For white males, the average earnings in noncompetitive industries are 22 percent higher than in competitive industries, and the pay-off to the highest levels of schooling is much higher in noncompetitive industries, but most other coefficients are very similar. So the level of income is lower in competitive industries but the treatment of most worker characteristics is almost identical.

For black males there are more differences between the two industry segments especially with regards to education and vocational training. In general, education measured simply by years of school completed is not uniformly rewarded as in the case of whites. There appears to be a credential effect for blacks in the competitive sector where "degree-receiving" years are much more highly rewarded than "non-degree-receiving" years. In the noncompetitive sector high levels of schooling and vocational training are not significantly more rewarded although there is less of the credential effect present for lower levels of post-secondary education. Again, the average earnings are much higher in noncompetitive than in competitive industries.

Part of the explanation for this large difference in earnings was found in the distribution of workers among the segments:[11/] of the total white males in the three occupational segments in competitive industry in 1970, 15 percent were in secondary jobs and 23 percent were in primary independent jobs; in noncompetitive industries, 11 percent were in secondary jobs and 31 percent in primary independent jobs. Furthermore, there were large average earnings differences between competitive and noncompetitive industries in the secondary and primary subordinate segments, especially in the former.

It is in this secondary segment that the largest differences in the earnings function occur: If we take the estimated coefficients as the single best estimators of the age-earnings relationship, we find that even excluding the youngest age group, the age-earnings curve is much steeper in the noncompetitive industries up through the 35-44 year old age group (the left out dummy variable). In noncompetitive industries, those in secondary jobs face age-earnings profiles very similar (almost identical to) those in primary subordinate jobs, but with average incomes about $1,500 lower.

The other important result is that the education-earnings and age-earnings profiles for primary subordinate jobs are similar for both types of industries. The age profile is less steep for noncompetitive industries (beginning with the 20-24 year old age group), probably because starting salaries are much higher there; on the other hand, the chance for high salary increases over working life are apparently greater in competitive industries, although the average salary is not as high as in the concentrated segment.

In addition, it is true that competitive industries have a higher fraction of secondary and primary subordinate workers, and that they have a higher percentage of black male and women workers (46 versus 40 percent for concentrated industries).[12/] Secondary white workers in competitive industries also have age-earnings profiles more consistent with the earnings profiles of secondary labor markets as characterized by segmented labor market theory. However, we would also expect from the theory that primary subordinate workers in competitive industries would have age-earnings profiles which do not reward more years on the job. Our estimates show that this hypothesis not true -- primary subordinate workers in competitive industries have lower average income, but their education and age are treated similarly to those characteristics of workers in the noncompetitive sector.

Our results indicate that there is considerable stability over a five-year period in the types of jobs and the types of industries people work in; that there are large earnings differences between different occupational segments and between private competitive and noncompetitive industries; and that the relationship between education, work experience, and earnings differs between types of jobs but not between types of industries. This relationship also differs by race, even to the extent that the public sector pays blacks more for the same type of jobs than in private competitive industries, but pays whites less.

None of our results "proves" that a segmented labor market exists or does not exist, but they do show that some of the notions of segmented labor market theory about the way labor markets operated tend to be true and others false. Movement between jobs and industries is fairly restricted, partly, we suppose, because of differences in educational levels "required" by employers for different jobs, and partly because of limited access to higher-paying, capital-intensive monopoly industries. This means that the characteristics of the particular labor market in which people are located heavily influence the reward level and reward structure which people will most probably face throughout their working careers. In some cases, like the secondary market, this structure results in very low returns to more schooling and to increased time in the labor force; in primary independent jobs, the opposite is true. As long as people work in the secondary market (and a high percentage of blacks do) increasing their education and training can only raise their incomes if the additional investment moves them out of secondary jobs into higher-paying [illegible]

In the case of competitive versus noncompetitive industries and the private versus the public sector, the situation is somewhat different; while wage levels in these different sectors may be very different, the treatment of characteristics of workers in each of these markets is not very different. Thus the move from a competitive to a noncompetitive industry in and of itself raises a worker's income without any perceptible training or education increase. For black workers, the move from the private competitive to the public sector accomplishes a similar increase in wages, while for whites a move from the public to the private sector raises incomes.

Our findings on the marriage-earnings and vocational training relations do not support the labor market segmentation argument that secondary jobs and competitive industries demand more "unstable" workers. If instability were a generally desired characteristic of workers in the secondary labor market, we would not expect to find higher salaries paid for married workers or those with some specialized training, other variables accounted for, unless married workers, and vocationally trained -- for some reason -- were easier to fire or had higher turnover rates than single workers. Both are doubtful premises. On similar grounds, Rosenberg also questions the argument that instability is a desired trait of secondary workers: he shows that secondary workers have a relatively long average job tenure (Rosenberg 1975, Table 3-10), and that while secondary workers have higher job turnover than primary ones, the differences are not as great as segmentation theory would lead us to expect (Rosenberg, 1975, Table 3-7).

Our analysis raises even more fundamental questions about the current formulation of segmentation theory. We have shown that black males in the primary subordinate labor market have a similar reward level and structure as whites in the secondary market. This suggests that blacks in the secondary market are somehow in the "true" secondary market, while white secondary workers and black primary subordinate workers work in jobs which are low level primary subordinate (women in private primary subordinate jobs also fall into this category). White males in primary subordinate jobs, women in public primary subordinate jobs, and perhaps black males in primary independent jobs in the private sector appear to form yet another -- and somewhat separate -- labor market. Finally, white men and women in primary jobs have the relatively creative, self-directed, high-paying jobs associated with managerial and professional work. It is these anomolies in the dual and GRE formulations of segmented labor markets that led us to develop the new configurations presented in Chapter 3.

Some Conclusions

Despite rather different definitions of labor market segments in the four empirical studies we have reviewed, there are a number of tentative conclusions we can reach concerning segmentation:

1. There is substantial mobility between secondary and primary jobs, particularly for young whites. Blacks have lower mobility than whites. Women have somewhat lower mobility than men.

2. The segmentation theory view that secondary jobs are marked by high instability and turnover is subject to serious question on a number of grounds.

3. Mobility between secondary and primary segments, while affected by education and age (the greater a person's age, the less likely mobility), is not very well explained by any of the studies reviewed. In that sense, it is largely "random," at least in terms of human capital variables, and therefore supports the segmentation theory concept that what mobility between segments does exist is not based on merit or productivity, and that those of equal education and age in the secondary and primary subordinate segment are not different except in the type of work they do and the salary they receive.

4. Education and labor market experience seem to play a much less important role in explaining earnings differences among individuals in the secondary market than in primary subordinate or primary independent jobs. This does not appear to be a statistical artifact of truncating earnings through segmentation, since all three segments are truncated. This finding supports the theory's view that increasing education and training of individuals in secondary jobs will not have a significant effect on their earnings.

5. Lack of interindustry differences in the shape of the earnings functions also contradicts the segmentation theory view of the differential role of human capital in monopoly and competitive industries. "Internal labor markets" seem to exist in both types of industries, although ideally we would want to test this hypothesis at the firm level. Nevertheless, non-competitive industries pay higher salaries to workers than competitive, even when the human capital characteristics of workers are accounted for.

We conclude with Rosenberg that the proper concept of the secondary labor market which emerges from these results is one of a large reserve labor force, low-paid and concentrated in competitive industries, which is not unstable in terms of turnover rates, has some opportunity for mobility to primary jobs, and is likely to be disproportionately black, female, and immigrant. The pay-off to education and experience in this secondary market is much lower than in the primary, and the mobility of these groups into the primary segments depends largely on capitalist expansion and the emergence of new groups of secondary workers to take their place, as well as the growth of the public sector (Carnoy, Girling, and Rumberger, 1976). For no matter how much neo-classical economists may argue for education and training programs as the solution to the low incomes associated with secondary jobs, the fact is that the expansion of public sector primary jobs in the past generation has been the single most important factor explaining the upward mobility of minorities and women into professional and administrative jobs. Indeed, if we also include public expenditures on defense and space, we can argue that the employment of women in primary subordinate jobs has been heavily influenced by the public sector. Therefore, whatever shift in the labor market in the United States has occurred in favor of minority groups and women has come from the demand side (structural changes in the demand for labor) rather than increased education and training of blacks and women relative to white males.

FOOTNOTES

1. It should be pointed out that neo-classical economists are now arguing that these same observable phenomena (differential treatment and limited mobility) can be explained by neo-classical theory (Wachter, 1974). Nevertheless, segmented labor market theory has a completely different explanation for the existence of these phenomena, arguing that differential treatment and low mobility between segments are phenomena which are rooted in the functioning of capitalist production and are not the result of temporary disequilibrium or a response to differential technology and different kinds of production (Gordon, Edwards, and Reich, 1973a).

2. We have defined the meaning of the occupational segments above (Chapter 3). For those readers interested in the exact formulation of the occupational and industrial segments from the 1970 U.S. Census classifications and detailed tables of all occupation and industry categories, this information is available from the authors. A brief description follows:

   The industrial sector was divided into competitive and non-competitive segments using data received from Barry Bluestone, William Murphy, and Mary Stevenson from the Institute of Labor and Industrial Relations, University of Michigan. We selected the variable of "average market power" in each industry category with which to determine the relative concentration of firms within each industry. Industries that showed a concentration of AMP greater than 40% were categorized as non-competitive and those less than 40% were categorized as competitive.

   The occupational sector was divided into four segments using data from the thesis of Robert Lucas (1973) which linked certain characteristics of jobs as described in the *Dictionary of Occupational Titles* to the classifications used by the Bureau of the Census. We used the variable of Specific Vocational Preparation (SVP) -- 9 categories -- and Relationship to People (RP) -- 5 categories -- with which to divide people into the secondary, primary subordinate and primary independent sectors.

   The General Education Level (GED) associated with each job in the census classification was purposely left out of our categorization scheme since we use worker's education as a variable in our mobility and earnings regressions. Secondary occupations were defined as those with model SVP equal to 1 or 2 (demonstration time to 30 days training required for the job) and RP equal to "helping" or "serving." Primary subordinate jobs were defined as SVP equal to 3, 4, or 5 and RP equal to helping or serving, and SVP equal to 6, 7, or 8 and RP equal to helping. Primary independent jobs were defined as those with SVP equal to 6 through 9 and RP equal to serving, supervising, instructing, or "no classification."

As mentioned above, some occupations were categorized as "crafts" because of high levels of training and our assumption about the labor market for such jobs.

Examples of a few census categories and their corresponding segment classification are:

1970 Occup. Code	1970 Occupational Description	Occupational Segment
012	Engineer - Electrical	Primary Independent
031	Lawyers	Primary Independent
085	Health Technicians	Primary Subordinate
123	Art, Music Teachers	Primary Independent
144	Secondary Teachers	Primary Independent
182	Dancers	Crafts
220	Office Managers	Primary Independent
310	Cashiers	Secondary
333	Messengers	Secondary
410	Brickmasons	Crafts
473	Mechanics - Auto	Primary Subordinate
534	Roofers and Slatters	Primary Subordinate
624	Graders and Sorters	Secondary
711	Parking Attendants	Secondary
822	Farm Labor - Paid	Secondary
935	Barbers	Primary Subordinate

3. It is important to point out that we are dealing here exclusively with intra-generational mobility and not inter-generational mobility, which is yet another important component of the operation of labor markets. We are concerned in this essay with what happens to people once they enter the labor market and only tangentially in how people get into one labor market or another.

4. Indeed, Rosenberg (1975) indicates that this is the case in three cities out of four, at least on the basis of the OLS regressions (see his Table 5-1).

5. A good example of the kind of error which can be made in this regard is the contention in a recent paper by Richard Freeman presented at the University of Notre Dame's conference on Civil Rights (April 15-17, 1975) that discrimination in the United States is decreasing since first jobs of young blacks and whites for a similar education level are essentially the same, including the income they pay (although we do not look at mobility by educational level, occupational segments in our study are highly correlated with education levels). What our results show is that for lower educated blacks and whites, there should be an important divergence over the next five years in job mobility of the two races, with whites tending to move into higher paying occupations, while blacks tend to stay in the lower paying occupations. On the other hand, among those with higher education, whites are more likely to move into lower positions. Therefore, the fact that young blacks are getting similar paying jobs for

the same amount of education may have significance in comparison with the situation 10 years ago for the same age group, but it does not mean that five years from now this same group of white and black males will have similar incomes.

6. Women are more likely than men to move in and out of the labor force. In our sample, the percentage of women who worked in 1965 but did not in 1970 declined as occupational status rose (from 30 to 23 percent for white women and 28 to 16 percent for black women), but the percentage is much higher than for men in each segment.

7. Since the dependent variable here is a dichotomous variable (mobility or non-mobility) the error term of the least-squares regression is not normally distributed. Thus a profit analysis (maximum likelihood estimation) is more appropriate to obtain non-biased estimators. The estimators here are biased, and we will not know the degree of their bias until we run the maximum likelihood estimates.

8. We analyze differences between the private and public sector in more detail in Carnoy, Girling and Rumberger, 1976.

9. "Specific" training raises white earnings by about $400 annually, other variables constant, while for blacks the increase is about $500-$700 in secondary jobs and more than $1,000 in primary subordinate jobs.

10. Rosenberg (1975) argues that the nature of secondary jobs encourages a high degree of instability, but many secondary workers may in fact display individual stable work characteristics in such jobs (see his p. 74).

11. The small number of observations in the noncompetitive category precluded making similar estimates for black males.

12. These latter figures are drawn from parallel research on the female labor force and from Carnoy and Rumberger, 1976, Tables 9 and 10.

CHAPTER 5

Econometric Studies of Segmented Labor Markets in Developing Countries

Within the last two years, several econometric studies of labor markets have been carired out in low-income countries. In this chapter, we summarize the results of five such studies, one in Asia, one in Africa, and three in Latin America. For the most part, they concentrate on differences in earnings functions between different types of jobs, although the Asian study is able to relate present occupation to first job in the labor market and first job in the firm, and the African study undertakes a detailed analysis of differences between the modern and traditional sectors of the economy.

Labor Market Segmentation in Singapore

Liu (1975) used a two-stage survey of industrial establishments in Singapore's manufacturing sector for his data base. The first stage was conducted among managerial personnel in the selected firms, and was designed to get information on the firm's output, sales, capital structure, job breakdown, hiring policies, preferred qualifications for each job, promotion policies, and training offered to employees. One hundred twenty-four firms employing about 9 percent of Singapore's labor force were surveyed, with a response rate of 83 percent. Based on the information about jobs obtained from that survey, jobs were classified as either primary or secondary: jobs were delineated into two groups in such a way that there was almost no possibility of mobility between the two; and the mean earnings of jobs in one group were above the mean earnings of all jobs in the firm, while the mean earnings of jobs in the lower group were below the mean earnings of all jobs in the firm. In the second stage of the survey 133 firms participated. In all, 785 male employees in these 133 firms were identified as working in primary jobs, and 7,651 in secondary jobs. 460 male primary workers and 1,105 secondary workers were selected for interview, of which 333 and 915 responded.

The great advantage of this survey is that Liu was able to collect data at the firm level and study the educational, sex, and ethnic preferences of workers from employer interviews. He found, for example, that for high level jobs, the educational requirements increase with size of firm; indeed, educational requirements for all but production jobs are greater in the larger firms. Furthermore, in firms with 50 or more workers, educational requirements divide jobs into three clusters: high level professional and administrative (university); white collar and technical blue collar jobs (secondary school); low level production jobs (primary education). In firms with less than 50 employees, the pattern is there but is not as clear. So, larger firms seem to make use of education as a screening device more than smaller ones. Male workers are preferred to female except in low level production jobs and white collar (secretarial) jobs, and Chinese workers are preferred to other ethnic groups.

The Recursive Model of Access to Primary and Secondary Jobs

On the basis of the second stage sample interview data taken in 1974, Liu estimates equations relating probability of getting a primary segment first job in the labor market as a function of education, social class, and other variables. This parallels Rosenberg's estimates for the United States.

Liu's results are similar to Rosenberg's in some ways, but very different in others. Like Rosenberg, he finds that education (particularly higher education in Liu's case) is the single most significant explainer of first job, along with social class variables (Rosenberg's data don't include a measure of social class). Liu also finds that education plays a much smaller role in determining current job than either first job or first job in the firm (see Table V-1).

Thus, the role of human capital is much more important in an individual's first job in the labor market than in his first job with the firm or his current job. The bulk of the effect of schooling and pre-schooling (social class) variables as a predictor of current job operate indirectly through their effect on first job in the labor market and first job in the firm. This is shown in the path model which Liu develops from his recursive equations (see Figure V-1). The total effect of schooling on current job (J_3) is given by the sum of a direct effect, 0.190, and an indirect effect through first job in the firm (J_2), given by (0.525)(0.593) = 0.311. The total effect is therefore 0.501, which implies that schooling is, in fact, responsible for just over one-half of the variation in the probability of presently working in a primary job, and 62 percent of this impact operates directly indirectly through its effect on the first job in the present firm. Similarly, the path model shows that socioeconomic variables have important indirect effects on current job through schooling and first job in the firm (Table V-2). If social class variables were run on current job in a single equation model, their effect would be seriously underestimated.

TABLE V-1

Singapore: Probability of Primary Job

Estimated as a Function of Independent Variables, Urban Males, 1974

	Probability of First Job in Primary Labor Market (J_1)		Probability of Primary First Job in Present Firm (J_2)		Probability of Primary Present Job (J_3)	
	1	2	1	2	1	2
SCIT	*	*	*	*	*	*
MARRIAGE	---	---	---	---	0.114 (54.38)	0.129 (71.65)
URBAN	*	*	---	*	*	*
SUBURB	*	*	0.048 (4.05)	0.061 (6.37)	*	*
RURAL	*	0.062 (4.64)	*	*	*	*
CHINESE	*	*	*	*	*	*
MALAY	*	*	*	*	*	*
EUROPEAN	*	*	**	0.098 (9.15)	*	**
SES_1	0.018 (18.79)	0.024 (29.8)	0.021 (22.84)	0.022 (24.00)	0.009 (5.96)	0.008 (5.16)
SES_2	0.036 (11.81)	0.036 (10/63)	0.041 (13.51)	0.034 (9.15)	0.024 (7.70)	0.021 (5.53)
FATHER'S EDUC.	-0.006 (5.26)	-0.008 (7.43)	0.007 (6.27)	0.006 (4.64)	*	*
MOTHER'S EDUC.	*	0.008	*	*	*	*

SOURCE: Liu, 1975, pp. 31-32.

* The coefficient is significantly different from zero at both the 5% and the 10% level.

**The coefficient is significantly different from zero at the 10% level but not at the 5% level.

The figures in brackets are F-statistics.

TABLE V-1 (cont'd)

SCHOOL0 (No schooling)	**	---	-0.285 (15.95)	---	-0.145 (6.58)	---
SCHOOL1 (Some primary)	-0.140 (9.37)	---	-0.247 (25.35)	---	-0.140 (13.19)	---
SCHOOL2 (Complete primary)	-0.143 (7.83)	---	-0.220 (16.41)	---	-0.096 (5.00)	---
SCHOOL3 (Some secondary)	-0.132 (9.18)	---	-0.221 (22.49)	---	-0.087 (5.62)	---
SCHOOL4 (Complete secondary)	*	---	*	---	*	---
SCHOOL6 (Technical college)	0.127 (7.07)	---	0.118 (5.37)	---	0.095 (5.76)	---
SCHOOL7 (Completed university)	0.482 (98.58)	---	0.184 (11.64)	---	0.158 (14.26)	---
SCHOOL (Years of schooling)	---	0.032 (119.00)	---	0.030 (93.08)	---	0.021 (72.79)
VI	*	-0.003 (4.08)	*	*	*	*
HEALTH	---	---	---	---	*	*
J_1	---	---	0.218 (51.49)	0.282 (94.59)	*	*
J_2	---	---	---	---	0.612 (747.00)	0.624 (795.55)
CONSTANT	0.040	-0.321	0.089	-0.318	-0.077	-0.317
R^2	0.326	0.231	0.415	0.390	0.685	0.682

---

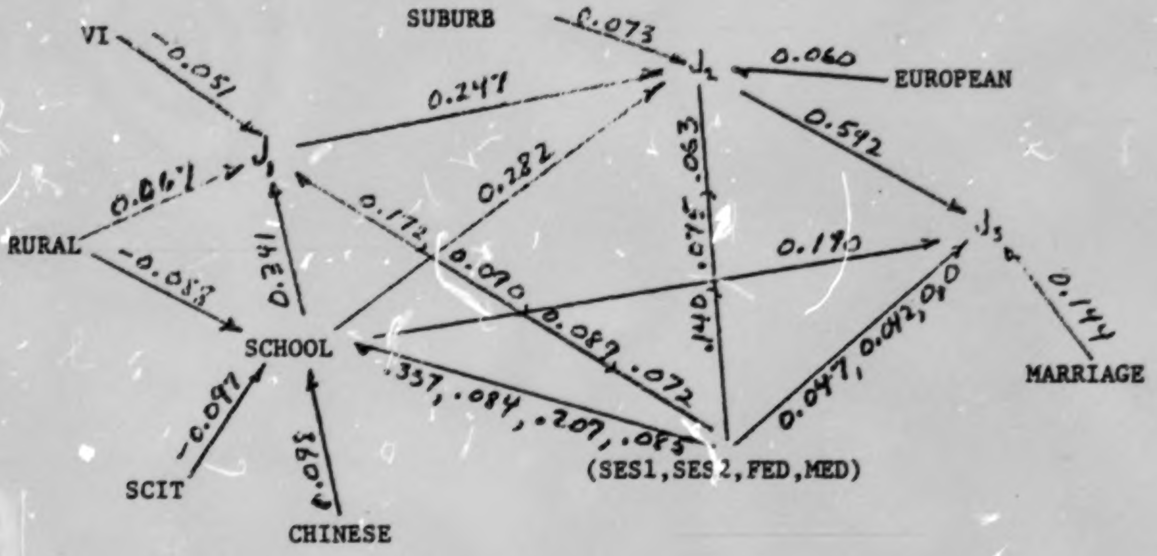
* The coefficient is significantly different from zero at both the 5% and the 10% level.

** The coefficient is significantly different from zero at the 10% level but not at the 5% level.

The figures in brackets are F-statistics.

FIGURE V-1

Singapore: Recursive Model for Access to Primary and Secondary Jobs, Urban Males, 1974


VI
-0.051
SUBURB
0.073
J_2
0.060
EUROPEAN
0.247
J_1
0.282
0.067
RURAL
-0.053
0.341
0.172
0.090
0.087, .072
.041, .075, .083
0.592
J_3
0.190
0.047, 0.042, 0.0
0.144
MARRIAGE
SCHOOL
.337, .084, .207, .085
-0.097
SCIT
0.093
CHINESE
(SES1,SES2,FED,MED)

SOURCE: Liu, 1975, p. 34.

Unlike Rosenberg's estimates for the U.S., however, Liu finds that first job in the labor market is a "reasonably accurate predictor" of present job, primarily through its strong indirect effect of (0.593)(0.454) = 0.268 operating through first job in the firm (J_2)

Mobility Between Labor Segments

And unlike Rosenberg, Liu finds that there is relatively restricted mobility between secondary and primary jobs (Tables V-3a and V-3b). The average length of time from first job in the labor market (J_1) and first job in the firm (J_2) is eight years and between J_2 and current job (J_3),

TABLE V-2

Singapore: Direct and Indirect Effects of Social Class on Current Job

Social Class Variable	Direct Effect	Indirect Effects		Total Effect
		Through School	Through J_2	
SES1	0.047	0.076	0.265	0.408
SES2	0.042	0.057	0.179	0.278
Father's Education	0.000	0.084	0.191	0.275
Mother's Education	0.000	0.073	0.170	0.243

SOURCE: Liu, 1975, p. 35.

TABLE V-3a

Singapore: Probability of Mobility Between First Job in Labor Market and First Job in Firm

	Count (Row %)	First Job in Firm: Sec.	First Job in Firm: Prim.	Row Total
First Job in Labor Market	Sec.	896 (85.5%)	152 (14.5%)	1048 (84.0%)
First Job in Labor Market	Prim.	67 (33.5%)	133 (66.5%)	200 (16.0%)
	Column Total	963 (77.2%)	285 (22.8%)	1248 (100%)

SOURCE: Liu, 1975, p. 36.

TABLE V-3b

Singapore: Probability of Mobility Between First Job in Firm and Current Job

	Count (Row %)	Current Job: Sec.	Current Job: Prim.	Row Total
First Job in Firm	Sec.	888 (92.2%)	75 (7.8%)	963 (77.2%)
First Job in Firm	Prim.	27 (9.5%)	258 (90.5%)	285 (22.8%)
	Column Total	915 (73.3%)	333 (26.7%)	1248 (100%)

SOURCE: Liu, 1975, p. 36.

four years. Finally, Liu's results differ from Rosenberg's in that education is an important explainer of mobility from secondary J_1 to primary J_2 and from secondary J_2 to primary J_3 (see Table V-4). Liu finds that social class is also important in the mobility equations and (in agreement with Andrisani's results) so is being married. Not only that, but Liu is able to explain about 25 percent of the variance in mobility, much higher than the U.S. results.

In part, these differences must be attributed to the way that Liu defines his segments. His secondary and primary jobs are defined in a way that is highly correlated with the entry educational level of a job, so education will (by definition) play an important role in determining who moves from one job to another. On the other hand, the lower mobility of workers between segments and the important effect of first job and of education on current job may indicate a greater rigidity in Singapore's labor market than exists in the U.S. market. Generally, studies of developing country labor markets have indicated a greater importance of education in earnings functions and in explaining occupational position than in the United States (see Carnoy, 1975 for some Latin American examples).

Earnings Functions

Liu's estimates of earnings functions (Table V-5) in the secondary and primary markets yield the expected result that the coefficient of schooling is more than five times as high for primary workers than for secondary. However, there are also a number of unexpected results: a) being married has a high pay-off to workers in secondary jobs but not primary (this coincides with the Center for Economic Studies results for the U.S.), indicating possible employer preference for stability among

TABLE V-4

Singapore: Mobility from Secondary to Primary Jobs

Estimated as a Function of Independent Variables, Urban Males, 1974

Dep. Var. / Indep. Var.	Secondary J_1 → Primary First Job in Present Firm (J_2)		Secondary J_2 → Primary Present Job (J_3)	
	1	2	1	2
SCIT	*	*	*	*
MARRIAGE	0.124 (37.25)	0.160 (64.80)	0.093 (35.21	0.130 (67.03)
HEALTH	---	---	*	*
URBAN	*	*	*	*
SUBURB	*	*	*	*
RURAL	*	*	*	*
CHINESE	*	*	*	*
MALAY	*	*	*	*
EUROPEAN	*	0.124	0.154 (6.31)	0.200 (9.95)
SES1	0.014 (8.56)	0.013 (7.38)	0.016 (14.96)	0.017 (16.36)
SES2	0.040 (37.26)	0.034 (7.86)	**	*

SOURCE: Liu, 1975, p. 37-38

* The coefficient is not significantly different from zero at both the 5% and 10% levels.

** The coefficient is significantly different from zero at the 10% level, but not at the 5% level.

The figures in brackets are F-statistics.

TABLE V-4 (cont'd)

FED	0.006 (4.23)	*	*	*
MED	*	*	*	*
SCHOOL0	-0.194 (6.45)	---	-0.123 (4.35)	---
SCHOOL1	-0.145 (7.09)	---	-0.137 (8.93)	---
SCHOOL2	-0.129 (4.75)	---	**	---
SCHOOL3	-0.108 (4.26)	---	**	---
SCHOOL4	*	---	*	---
SCHOOL6	0.230 (13.21)	---	0.264 (21.30)	---
SCHOOL7	0.273 (11.39)	---	0.530 (52.42)	---
SCHOOL	---	0.027 (63.79)	---	0.026 (91.29)
VI	*	*	*	*
CONSTANT	-0.118	-0.420	-0.108	-0.384
R^2	0.258	0.234	0.297	0.235

---

* The coefficient is not significantly different from zero at both the 5% and 10% levels.

** The coefficient is significantly different from zero at the 10% level, but not at the 5% level.

The figures in brackets are F-statistics.

TABLE V-5

Singapore: Regression Estimates, Dependent Variable

Monthly Earnings, Urban Males, 1974

Independent Variables	All Workers		Primary Workers		Secondary Workers	
	1	2	1	2	1	2
SCIT	*	*	*	*	*	*
MARRIAGE	114.399 (21.87)	142.128 (29.94)	**	**	90.495 (53.44)	93.320 (56.62)
HEALTH	*	*	230.778 (6.44)	224.363 (6.33)	*	*
URBAN	*	*	*	*	*	*
SUBURB	*	*	*	*	**	*
RURAL	*	*	*	*	-43.149 (8.58)	-39.627 (7.25)
CHINESE	*	*	**	**	35.276 (9.64)	36.285 (10.09)
MALAY	*	*	*	*	*	*
EUROPEAN	989.450 (132.63)	1073.244 (137.35)	690.542 (20.75)	717.652 (22.95)	---[2]	---[2]
SES1	17.689 (11.67)	21.832 (15.56)	**	**	*	*
SES2	*	*	*	**	*	*
FED	*	*	*	*	*	*
MED	**	12.142 (6.80)	*	**	*	*

SOURCE: Liu, 1975 pp. 25-26.

* The coefficient is not significantly different from zero at both the 5% and the 10% level.

** The coefficient is not significantly different from zero at the 5% level, but is significantly different at the 10% level.

[2] This variable was not entered because there were no Europeans in the sample that were included in the secondary segment of the labor market.

The figures in brackets are F-statistics.

TABLE V-5 (cont'd)

SCHOOL0	-369.526 (21.04)	---	*	---	-251.096 (36.72)	---
SCHOOL1	-260.069 (16.90)	---	-635.313 (4.51)	---	-166.188 (25.04)	---
SCHOOL2	-250.103 (13.74)	---	**	---	-154.452 (19.13)	---
SCHOOL3	-196.338 (10.54)	---	*	---	-112.422 (12.34)	---
SCHOOL4	*	---	*	---	**	---
SCHOOL6	290.159 (13.21)	---	*	---	*	---
SCHOOL7	958.030 (90.80)	---	374.180 (4.66)	---	*	---
SCHOOL	---	40.055 (91.88)	---	91.766 (27.48)	---	16.350 (62.25)
VI	**	*	*	*	1.883 (5.24)	**
COEXP	0.527 (8.11)	0.495 (6.80)	*	*	0.333 (12.16)	0.311 (10.60)
WORKYR	4.547 (10.916)	6.105 (17.27)	19.213 (7.79)	17.165 (6.95)	2.972 (18.03)	3.315 (22.19)
TRAIN1	-53.826 (4.03)	-61.443 (4.66)	*	*	*	*
TRAIN2	144.054 (12.02)	157.451 (12.63)	**	*	72.795 (10.52)	70.941 (9.90)
TRADE UNION	*	**	*	*	*	*
HOURS	0.697 (9.48)	0.640 (7.05)	2.930 (4.71)	2.832 (4.78)	0.748 (42.91)	0.746 (42.61)
SIZE OF FIRM	0.060 (9.57	0.56 (7.23)	*	*	0.065 (43.63)	0.063 (41.50)

TABLE V-5 (cont'd)

SALES OF FIRM	*	*	25.594 (5.21)	23.087 (4.49)	-1.760 (4.59)	**
PCAPITAL OF FIRM	0.00043 (13.88)	0.00048 (15.72)	*	*	0.00051 (77.54)	0.00055 (91.49)
CONSTANT	228.329	-306.015	232.905	-786.070	178.536	-74.524
R^2	0.497	0.420	0.510	0.506	0.409	0.397

---

* The coefficient is not significantly different from zero at both the 5% and the 10% level.

** The coefficient is not significantly different from zero at the 5% level, but is significantly different at the 10% level.

The figures in brackets are F-statistics.

secondary workers/ b) experience in the firm (seniority) is rewarded in secondary jobs (which contradicts the notion of employer preference for instability in that segment) even though the coefficient is small; c) experience in the labor market is rewarded in both primary and secondary jobs, but, as expected, the coefficient of this variable is much smaller in the lower segment; and d) the effect of training is not significant for primary workers, but is for secondary, again contradicting the prediction of segmentation theory.

Thus, in contrast to U.S. notions of labor market segmentation, Liu finds that such segments seem to exist in Singapore, but that they re defined largely by educational levels and that eddltional education increases the probability of mobility between segments. While the earnings pay-off to schooling is lower in the secondary segment, this may in part be due to the lower level of schooling (and therefore lower investment in schooling) held by secondary workers. Neither is there persuasive evidence that secondary workers are not rewarded for stability of work behavior or for training and experience. All of this indicates much more of a human capital version of segmentation than a dual labor market version. However, the numbers of workers in Liu's segments and the fact that in the primary segment, only university completion has a positive effect on earnings and in the secondary segment, there is a positive effect of education on earnings from the lowest levels of schooling to secondary completion, indicates that Liu's secondary segment includes not only secondary workers defined as they have been in the U.S. and in the Latin American studies discussed below, but primary subordinate production workers as well, while his primary segment is predominantly "primary independent." This would at least explain many of the unexpected results found in his estimates of earnings functions. This possibility is especially persuasive because Liu's sample is restricted to Singapore's manufacturing sector, where many of the workers Liu defines as "secondary" would be in rather stable production jobs on internal job ladders. In this sense his finding that years of experience outside and inside the firm is highly paid off in the primary market (read primary independent) while internal and external experience is rewarded in the secondary (read primary subordinate) is perfectly consistent with Doeringer and Piore's view of internal labor markets.

Earnings Functions in Brazil

As part of his Ph.D. dissertation on education and income distribution in Brazil, Velloso (1975) estimated earnings functions by labor market segment and also tested for the effect of education, experience, and employment (his independent variables) on the distribution of earnings within segment. Velloso used as his data set urban males 14-60 years old in the labor force, not enrolled in school and with non-zero income from the 1.27 percent sample of the 1970 demographic census of Brazil. He included both those who were employed and unemployed (but looking for work) at the time of the census. He excludes self-employed persons and employers.

Velloso defines his segments in the following way:

> Precise empirical cut-off points for the classification of workers by segments have not been developed as of now. The nature of the task performed appears to be one of the most promising avenues for such classification. In the absence of such information two procedures were used. In a first stage, workers were grouped by occupation and in a later stage, a composite index of skill (schooling) and earnings was used to separate out the segments. Thus, in the first stage all professionals, managers, administrators, college professors and secondary education teachers,

> totalling 27 occupations, were included in the primary independent segment (comprising employees and self-employed -- mostly professional -- persons). All other 232 census occupations were assigned to a cluster involving both the primary routinized and secondary segments (these include only employees). In the former we included virtually all white collar workers. The chief criterion for the initial separation of blue-collar workers between the segments was occupation, and next the level of skill expected to be required.
>
> The upper and lower clusters of the occupations in these segments are readily identified in terms of the nature of the tasks involved and the level of skill usually associated with them. After an examination of the scale constructed by Silva (1973), using a composite index of schooling and income means for all occupations of the 1970 census, an arbitrary cut-off point was chosen (index=8).1/ The separation may not be accurate as one could wish, since some overlap probably still remains, but in general it appears to be a satisfactory approximation. It is relevant to note that secondary workers in our classification are mostly concentrated in industries which usually tend to be more competitive like textiles, clothing, food and beverage, while a large proportion of workers in the primary routinized segment are located in sectors where oligopoly often prevails, such as automobile and metallurgical industries and transportation services. This is in accordance with the prediction of dual labor market theories regarding the distribution of segments by economic sectors and types of industries, thus lending additional support to the classification used. (Velloso, 1975a. pp. 12-13).

Table V-6 shows the earnings functions Velloso estimated for the three segments. The functions themselves are not strictly comparable with most others we will analyze in this chapter since they include only three independent variables, education, age, and employment, where emloyment is measured as the number of months worked during the year. The measure of education is also different from the other studies, since it is the investment in schooling rather than the years of schooling. Thus, years of schooling are weighted by the cost of (average proportion of earnings invested in) each year.

The estimated equations by segment indicate that in all three types of jobs, education, labor market experience (as measured by age) and months worked are significant variables in explaining earnings.

TABLE V-6

BRAZIL: REGRESSION ESTIMATES FOR SEGMENTS OF THE MARKETS[a], URBAN MALES, 1970[b]

Urban Aggregate

$$\text{In } Y = 6.365 + 0.180\ \text{INV} + 0.019\ \text{AGE} + 0.229\ \text{LOGL}$$

(2,379.5)   (925.5)   (255.5)

$R^2 = 0.511$

$N^c = 6{,}504{,}324$

Primary Independent

$$\text{In } Y = 7.136 + 0.115\ \text{INV} + 0.019\ \text{AGE} + 0.255\ \text{LOGL}$$

(583.6)   (212.1)   (70.9)

$R^2 = 0.429$

$N^c = 520{,}170$

Primary Routinized

$$\text{In } Y = 6.806 + 0.130\ \text{INV} + 0.022\ \text{AGE} + 0.141\ \text{LOGL}$$

(941.6)   (644.5)   (95.0)

$R^2 = 0.332$

$N^c = 2{,}554{,}198$

Secondary

$$\text{In } Y = 6.373 + 0.173\ \text{INV} + 0.015\ \text{AGE} + 0.215\ \text{LOGL}$$

(958.4)   (613.6)   (204.2)

$R^2 = 0.264$

$N^c = 3{,}429{,}956$

Source: 1.27 percent sample of the Demographic Census of Brazil, 1970

Notes:

[a] See text for definition of segments.

[b] t ratios in parentheses.

[c] Observations in the sample were individually weighted by the Brazilian Census Bureau (CI-FIBGE) so that sample observations represent those of the total population. The average weight is 78 for the whole population. For the secondary segment, for instance, the sample size is (3,429,956 ÷ 78) ≅ 43,974 observations.

Furthermore, the coefficient of investment in education is largest in the secondary market and lowest in the primary independent, quite the opposite of what the theory predicts. Of course, this is the investment in schooling and so much more accurately reflects the nature of the schooling variable; as we pointed out above, the lower coefficients of schooling associated with secondary labor markets might reflect the lower cost of the lower levels of schooling of people in the secondary market. The result that the age variable has a lower coefficient in secondary jobs than in either of the primary markets is consistent with segmented labor market predictions, but if the result were to be entirely consistent, the coefficient of age in the secondary equation should not be significant at all. The employment variable also does not behave consistently with the segmented labor market model.

Velloso uses these earnings functions to estimate the relative contribution of each independent variable to the variance in earnings within segment. Table V-7 shows these results. Education explains almost 88 percent of the variance in earnings in the primary independent segment, 70 percent in the primary routinized, and 76 percent in the secondary. Again, except for the secondary market, this result is consistent with others' findings about the relative effect of education on earnings in the upper and lower tiers of the primary market. The findings on age are also consistent except for the secondary market result, where 31 percent of earnings variance is explained by the variance in age. The employment variable makes a negligible contribution to earnings variance in all three equations, but is largest in the secondary market (consistent with the segmented market model).

TABLE V-7

BRAZIL: CONTRIBUTIONS OF SCHOOLING, AGE AND EMPLOYMENT TOWARD EARNINGS INEQUALITY IN SEGMENTS OF THE LABOR MARKET[a], URBAN MALES, 1970

Segments:	Aggregate		Primary Independent		Primary Routinized		Secondary	
Components	Effects	Relative Effects	Effects	Relative Effects	Effects	Relative Effects	Effects	Relative Effects
(I)	0.3060	83.73	0.2771	87.66	0.1068	70.31	0.0783	75.59
(A)	0.0463	12.66	0.0364	11.52	0.0497	32.72	0.0321	30.96
(L)	0.0035	0.96	0.0041	1.30	0.0011	0.72	0.0035	3.39
(I,A)	0.0016	3.18	0.0049	1.55	-0.0035	-2.30	-0.0112	-10.85
(I,L)	-0.0017	-0.46	-0.0055	-1.74	-0.0019	-1.25	0.0010	0.94
(A,L)	-0.0002	-0.07	-0.0008	-0.25	-0.0003	-0.20	-0.0001	- 0.02
Explained[b] Inequality =Var(Y)*	0.3655	100.0	0.3161	100.0	0.1519	100.0	0.1036	100.0
Observed Inequality=Var(Y)	0.7159		0.7362		0.4570		0.3921	
R^2=Var(Y)*/Var(Y)	0.5105		0.4293		0.3324		0.2642	

Source: Computed from regressions of the log of earnings on investments in schooling, age and employment (Table V-6). 1.27 percent sample of the Demographic Census of Brazil, 1970.

Notes: a. See text for definition of the segments.
b. Totals may not add due to rounding.

All in all, Velloso's results provide little support for the segmented labor market model; to the contrary, they indicate that human human capital theory does better in the Brazilian context in explaining urban market treatment of male workers. Although it may be possible that Velloso's definition of segments was such to place many primary subordinate workers in the secondary market, it is much more likely that secondary markets in Brazil (and other industrializing countries) have to be defined as males self-employed in low level services and commerce plus rural employed and subsistence farmers plus women and males employed in very low level service jobs. In all other jobs, education and experience appear to be highly rewarded.

Earnings Functions in Peru

Like Velloso, Toledo included earnings functions by labor market segment as part of his Ph.D. dissertation on education and earnings distribution (Toledo, 1976). Toledo used samples of the 1961 and 1972 Peruvian national censuses, limiting his analysis of labor market segmentation to urban males in the labor force, 14 years old and older.

Toledo divides the labor force into four occupational groups: secondary, primary subordinate, primary independent, and crafts. The segments are defined approximately in the same way as in the Center for Economic Studies analysis for the United States. One of the interesting differences between the U.S. and Peru segments is the much larger number of workers classified as "crafts." Fifteen percent of the sample in 1961 and 28 percent in 1972 fall into the crafts category. This gives us an opportunity to test whether the artisan group is more of a "marginal" or "true secondary" segment than the employees working in low level production and service jobs.

Tables V-8 and V-9 present the results of the earnings function estimates for 1961 and 1972. We have not included all the variables included by Toledo in his estimates: besides those shown, he also estimated the coefficients of dummy variables for region of the country and for principal language spoken by the individual (indigenous, indigenous plus Spanish, and only Spanish). The left-out dummy variable in schooling is "no schooling;" in age, 25-34 years old; in civil status, "married;" and in economic sector, "agriculture, and other primary." It is difficult to interpret the education coefficients in the estimated equations because the "no schooling" group in the primary subordinate and primary independent segments is a small percentage of those in the segment and apparently have rather high incomes (the coefficient of each variable in the difference between the log income of those with that level of schooling and those with no schooling). Nevertheless, we can make some comparisons in the following way:

	Secondary	Crafts	Primary sub.	Primary indep.
		1961		
Complete primary/ Incomplete primary	.205	.124	.171	.249
Complete secondary/ Complete primary	.253	.286	.306	.542
Complete university/ Complete secondary	.562	.627	.314	.285
		1972		
Complete primary/ Incomplete primary	.133	.173	.415	.139
Complete secondary/ Complete primary	.360	.220	.345	.768
Complete university/ Complete secondary	.357	.199	.091	.539

These are the differences between the coefficients estimated for the different schooling levels. First, we can see from Tables V-8 and V-9 that except for a few levels of schooling, formal schooling is rewarded with additional income in all four labor market segments. From the above differences in coefficients, it appears that there is no distinct difference in pay-off to education in the different segments. However, it is somewhat problemmatical to compare the returns to different levels of schooling across segments because the average schooling in secondary and crafts jobs is much lower than in primary subordinate or primary independent jobs: For example, in 1961, 85 percent of those in the secondary market and 82 percent in crafts completed primary school or less, while 58 percent in primary subordinate and 75 percent in primary independent jobs had secondary school or more. In 1972, about 75 percent in secondary jobs and 60 percent in crafts completed primary school or less, while 83 percent in primary subordinate and 90 percent in primary independent jobs had secondary school or more. Therefore, the most comparable return is to secondary school over completed primary since there is a sizeable percentage of workers in each segment who fall into the primary completed, secondary incomplete, and secondary completed categories. Making that comparison, we see that in 1961, there is a steadily increasing return as we move from the secondary segment to the primary independent. In 1972, the relation is less clear, although the return to primary subordinate plus primary independent is higher than secondary plus crafts.

In both 1961 and 1972, the age-earnings profiles of secondary and crafts jobs are flatter than those of the primary subordinate and

TABLE V-8

Peru: Regression Estimates, Dependent Variable Log Earnings
by Labor Market Segment, Urban Males, 1961

	Occupation Segment			
Independent Variable	Secondary	Primary Subordinate	Primary Independent	Crafts
Inc. primary	.156***	-.256***	-.697***	.218***
Comp. primary	.361***	-.085	-.448***	.342***
Inc. secondary	.501***	.066	-.261**	.417***
Comp. secondary	.614***	.221***	.094	.628***
Inc. university	.649***	.398***	.204*	.703***
Comp. university	1.176***	.535***	.379***	1.255***
Age 14-17	-.639***	-.840***	-.950***	-.672***
Age 18-21	-.301***	-.372***	-.347***	-.257***
Age 22-24	-.119***	-.187***	-.131*	.001
Age 35-44	.073***	.187***	.206***	.060
Age 45-54	.056*	.194***	.259***	.028
Age 55-64	-.006	.150***	.223***	.181**
Age 65+	-.157**	.183**	.126	-.228*
Single	-.125***	-.171***	-.204***	-.133***
Separated	-.045	-.176**	-.058	-.144
Mining	.880***	.206***	.633***	.263***
Manufacture	.452***	.047	.181	-.095
Electricity/Service	.367***	.044	-.045	-.253***
Construction	.421***	.160***	.175**	-.346***

SOURCE: Toledo, 1976

* Significant at a 10% level of significance.
** Significant at a 5% level of significance.
*** Significant at a 1% level of significance.

TABLE V-8 (cont'd)

Commerce	.546***	.167***	.191	.327
Transport/comm.	.623***	.068*	.069	-.076
Finance	.549***	.024	-.008	-.219**
R^2	.377	.358	.476	.252
N	5,477	2,668	1,090	1,740
Mean earnings	9.08	9.68	10.18	9.18
Mean weeks worked	42.95	47.26	47.39	43.11

---

* Significant at a 10% level of significance.
** Significant at a 5% level of significance.
*** Significant at a 1% level of significance.

TABLE V-9

Peru: Regression Estimates, Dependent Variable Log Earnings, by Labor Market Segment, Urban Males, 1972

Independent Variable	Secondary	Primary Subordinate	Primary Independent	Crafts
Inc. primary	.131***	-.735***	-1.266***	-.077
Comp. primary	.264***	-.320***	-1.127***	.096**
Inc. secondary	.346***	-.160***	-0.574***	.197***
Comp. secondary	.604***	.025	-0.359***	.316***
Inc. university	.817***	.080	-0.027	.429***
Comp. university	.961***	.116**	0.180**	.515***
Age 14-17	-.465***	-.280**	-1.552***	.682***
Age 18-21	-.288***	-.395***	- .422**	-.320***
Age 22-24	-.156***	-.206***	- .188**	-.191***
Age 35-44	.141***	.223***	.192***	.143***
Age 45-54	.149***	.244***	.367***	.184***
Age 55-64	.055	.166***	.224**	.157***
Age 65+	-.135**	.070	- .054	-.072
Single	-.146***	-.240***	-.249***	-.218***
Separated	-.122**	-.102*	-.236*	-.185***
Mining	.862***	.437***	.495***	.467***
Manufacture	.570***	.234***	.046	.113**
Electricity/Service	.448***	.131***	.105	.080**
Construction	.377***	.075**	.211**	-.036

SOURCE: Toledo, 1976

* Significant at a 10% level of significance.
** Significant at a 5% level of significance.
*** Significant at a 1% level of significance.

TABLE V-9 (cont'd)

Commerce	.844***	.260*	.750**	.048
Transport/Comm.	.396***	.228***	.099	[illegible]44
Finance	.485***	.078**	.098	-.049
Weeks worked	.004***	.009***	.004	.005
R^2	.286	.248	.393	.217
N	6442	3690	1250	4393
Mean log earnings	10.23 (.74)	10.96 (.64)	11.51 (.88)	10.58 (.66)
Mean weeks worked	46.87	49.94	50.24	48.58

---

* Significant at a 10% level of significance.
** Significant at a 5% level of significance.
*** Significant at a 1% level of significance.

primary independent segments (particularly if we exclude the 14-17 years old category). his confirms the segmented labor market model, but, at the same time, the profiles of all but crafts in 1961 show considerable increases in earnings with increased age. Human capital theory also predicts that the occupation characterized by lower education levels will have flatter age-earnings profiles because of fewer possibilities of worker investment in on-the-job training (Mincer, 1962).[2]

The negative effect of being single increases with higher occupational segments in both 1961 and 1972, but in fact married workers also get paid more than single in the secondary and crafts jobs, which agrees with our work in the U.S. (Carnoy and Rumberger, 1976).[3]

In total, Toledo's work indicates that although the pay-off to education, experience (age), and civil status is lower in secondary and crafts jobs than in the primary segment, the reward to those characteristics is positive and significant. The former supports segmentation theory, and the latter contradicts it. Of course, Toledo's analysis (because of data limitations) cannot tell us anything about mobility between his defined segments, so (as in Brazil) we can say little about the validity of the segments as he has defined them.

Earnings Functions in Mexico

In the third of three dissertations done (or in the process of being done) at Stanford on the relation of education to income distribution, Lobo also included earnings functions by labor market segment as part of his analysis for Mexico. He used samples of the 1960 and 1970 Mexican national censuses, like Toledo and Velloso, limiting this particular analysis to urban male wage earners, older than 14 years old.

As in Peru and our work for the United States, Lobo divides these urban wage earners into four occupational groups: secondary, primary subordinate, primary independent, and crafts. However, there are important differences in the percentage of the sample in the different segments in Brazil, Peru, and Mexico, and this shows how subject to differences in definition the size of segments is. The percentages for the three countries are the following:

Country/ Year	Secondary	Crafts	Primary Subordinate	Primary Independent
Brazil				
1970	52.7	--	39.3	8.0
Peru				
1961	49.9	15.8	24.3	9.9
1972	40.8	27.8	239.4	7.9
Mexico				
1960	19.5	17.5	55.8	7.2
1970	17.0	16.1	57.1	9.7

These figures indicate that the secondary labor markets as defined by Velloso and Toledo are considerably larger than Lobo's (even when we consider that there is no crafts segment in Velloso's study) and the primary subordinate segment is much smaller in Brazil and Peru. One of the arguments we made above is that the significant effect of age (experience) and education in the "secondary" segment in Brazil and Peru is precisely the result of having included too many occupations in that segment, in fact making it in large part a mixture of secondary and primary subordinate jobs. Lobo has been somewhat more careful in trying to include only those jobs in the secondary segment which require little or no training and experience. Crafts in Lobo's work were also carefully selected to avoid including jobs which should be more appropriately placed in the primary subordinate segment, although this is rather a difficult task. It is not completely clear, however, whether Lobo's definition of the secondary segment or Toledo's or Velloso's is the "best." Yet, it seems more logical that in urban areas, a high fraction of the labor force should be primary subordinate jobs, especially when we consider that in Lobo's sample of all wage earners, which includes agricultural workers and women, 51 percent of workers were classified as secondary in 1960 and 43 percent in 1970 (Lobo, 1977). In any case, as we shall discuss below, the issue of what is the "secondary" labor market is crucial to the analysis of labor markets in low-income countries.

Table V-10 and V-11 present the results of Lobo's earnings function estimates for 1960 and 1970. Lobo did not include economic sector variables in these regressions because a number of sectors were not represented in each segment. Nevertheless, the results give us a good indication of the possible differences in age and education-income profiles in the different segments. He avoided the difficulties of Toledo's estimates by leaving our the "primary complete" schooling dummy. Other dummies omitted are: 35-44 years of age; "single" in civil status; Federal District in region, and "family head" in position in family.

Unlike the Peru and Brazil studies, important differences appear in the effect of education and age on log income in the different seg-

TABLE V-10

Mexico: Regression Estimates, Dependent Variable
Log Earnings, by Labor Market Segment, Urban Males, 1960

Independent Variable	Secondary	Crafts	Primary Subordinate	Primary Independent
No school, illiterate	-.484***	-.372***	-.554***	-.807
No school, literate	-.226	-.267*	-.379***	.057
Primary incomplete	-.221**	-.166**	-.335***	-.691***
Lower secondary	.446**	.324	.292***	.402
Preparatory	-.210	.169	.461***	-.118
University incomplete	-.190	.317	.681***	.408**
University complete	-.699	—	.856***	.858***
Invalid school code	.075	-.127	-.202	.306
Age 15-17	-.197	-.315*	-.601***	-.951*
Age 18-21	-.174	-.204	-.322***	-.499
Age 22-24	-.121	.033	-.182**	-.905***
Age 25-34	.024	.017	-.084	-.443**
Age 45-54	.030	0.17	.064	-.061
Age 55-64	.123	-.293**	-.006	-.106
Age 65-99	-.041	.138	-.308**	-.938**
Time worked	.029*	.048***	-.016*	-.020
Attending school	.501*	.253	-.039	.408

SOURCE: Lobo, 1977

Notes: * Significant at a 10% level of significance.
** Significant at a 5% level of significance.
*** Significant at a 1% level of significance.

Region south	-.348*	-.454***	-.204*	.020
Region center east	-.440***	-.268	-.236***	.186
Region center west	-.370**	-.300***	-.286**	-.130
Gulf	.019	-.168	-.112	-.237
Region west	-.195*	-.161	-.176***	-.441**
Region north	-.069	.122	-.060	.279
Family relation	-.126	-.263**	-.138**	.234
Family unrelated	-.265	.173	-.114	-.285
Unknown	-.198	-.411*	-.181	.076
Married	.208*	.234*	.167**	.063
Other	.022	.018	.028	-.103
Constant	6.066	6.094	6.799	7.171
Adjusted R^2	.130	.195	.268	.344
N	516	464	1475	190
Mean log earnings	5.9447	6.0843	6.4536	7.0294
Ver log earnings	.812	.791	.814	.995
Mean monthly earnings	537	815	904	1765

* Significant at a 10% level of significance.
** Significant at a 5% level of significance.
*** Significant at a 1% level of significance.

TABLE V-11

Mexico: Regression Estimates, Dependent Variable Log Earnings, by Labor Market Segment, Urban Males, 1970

Independent Variable	Secondary	Crafts	Primary Subordinate	Primary Independent
No school, illiterate	-.384***	-.392***	-.426***	-.050
No school, literate	-.283**	.007	-.385***	-.870*
Primary incomplete	-.127*	-.208***	-.253***	-.703***
Lower secondary	.196	.093	.144***	.440**
Preparatory	.551***	1.272***	.391***	.264
Post-secondary	.499	-.711	.374***	.069
University incomplete	.826***	.249	.497***	.528***
University complete	.962**	—	.870***	.541***
Invalid school code	-.372	.058	.570**	.608*
Age 15-17	-.512***	-.946***	-.900***	-.825
Age 18-21	-.198*	-.594***	-.464***	-.916***
Age 22-24	-.148	-.337***	-.332***	-.702***
Age 25-34	-.067	0.262***	-.118**	-.318**
Age 45-54	.022	-.100	-.035	.067
Age 55-64	.008	-.379**	-.087	-.234
Age 65-99	-.153	-.268	-.189*	.084
Time worked	.028***	.038***	.036***	.033
Attending school	-.010	-.217	-.066	-.299**

SOURCE: Lobo, 1977

* Significant at a 10% level of significance.
** Significant at a 5% level of significance.
*** Significant at a 1% level of significance.

Region south	-.143	-.298	-.374***	-.032
Region center east	-.455***	-.497***	-.263***	-.524***
Region center west	-.249**	-.325***	-.210***	-.368**
Gulf	-.357***	-.594***	-.151**	-.370**
Region west	-.078	-.138	-.188***	-.154
Region north	.050	-.150*	-.041	-.178
Family relation	-.012	-.021	-.084	-.163
Family unrelated	-.055	-.844***	-.078	.099
Married	.247**	.030	.023	-.189
Other	.120	-.135	-.086	.118
Constant	6.518	6.930	6.931	7.608
Adjusted R^2	.219	.304	.273	.362
N	535	508	1801	308
Mean log earnings	6.6630	6.6212	6.9358	7.8957
Ver log earnings	.681	.789	.748	.874
Mean monthly earnings	988	974	1366	

* Significant at a 10% level of significance.
** Significant at a 5% level of significance.
*** Significant at a 1% level of significance.

ments in Mexico. In 1960, the increase in log earnings from additional schooling is greater throughout the range of education level in the primary subordinate labor market than in secondary or crafts jobs. Since a high fraction of primary independent workers have university education (38 percent), the effect of lower levels of schooling is not significant, but interestingly enough, university education does not have a higher pay-off in primary independent jobs than in primary subordinate. For all intents and purposes, age does not play a significant role in secondary and crafts jobs, but coefficients of age become increasingly significant (and large) as we move to higher segments. Interestingly enough, the differences in pay among region are greater in the secondary and crafts markets than in the primary market; i.e., workers in lower-paying jobs in poor regions get paid relatively less (compared to the richer regions) than in higher-paying jobs. Finally, being married is more important, salary-wise, in the secondary and crafts jobs than in the primary sector, again contradicting the allegedly lower pay-off to stable workers in secondary jobs.

The results for 1970 confirm the 1960 results as far as the age-income profiles are concerned, but there are some important changes in the education coefficients. Unlike the 1960 functions, in 1970 the secondary labor market shows a high pay-off to additional schooling all the way up through university. Indeed, the university coefficients of earnings for the secondary segment are larger than the corresponding coefficients in the primary occupations. While the same statements do not hold for crafts jobs, there appears to be a less strong case for differential effects of schooling in different types of jobs in 1970 than in 1960.

The effect of region of work on earnings is also somewhat different in 1970 than in 1960: the poorer regions continue to pay relatively less than richer regions in lower-paying jobs (secondary and crafts) than in primary subordinate, but poor regions pay badly relative to wealthier ones for primary independent jobs as well, an important shift from the 1960 results. Again, being married means higher pay in the secondary labor market and not in the primary, although the income-civil status relation is distorted by the inclusion of family position (highly correlated, for males, with civil status).

As in all the studies, the comparison of education-earnings relationships is difficult here because of the great difference in the distribution of schooling within each segment. These are the percentages of male workers with the various levels of schooling in the segments:

	Segment/Year							
	Secondary		Crafts		Prim. Subordinate		Prim. Independent	
Level of Schooling	1960	1970	1960	1970	1960	1970	1960	1970
Illiterate	15	12	[illegible]	14	4	5	1	2
Primary Incomplete	48	46	53	48	36	33	18	5
Primary Complete	23	23	25	24	32	32	20	17
Secondary School	4	6	3	4	14	14	10	9
		3	-	2	3	4	6	9
University Incomplete	1	1	-	-	3	3	22	18
University Complete		-	-	-	1	1	16	29

Given these percentages, we can only make meaningful comparisons across the board of the difference in earnings of those with primary incomplete and primary complete and between primary complete and lower secondary. In 1960, the smallest pay-off to finishing primary is in the crafts and secondary segments and the highest in the primary independent. The pay-off to lower secondary, however, appears as high or higher in the lower than in the higher segments. In 1970, the pay-offs to both finishing primary school and taking lower secondary rise from the secondary and crafts segments to the primary segments, and are by far the highest in primary independent jobs.

Thus, Lobo finds that in Mexico the secondary and crafts segments are characterized by lower rewards to schooling and age (experience) to the bulk of workers in those segments than to their counterparts in the primary labor market, particularly those in primary independent jobs. At the same time, workers in poorer regions who have secondary and crafts jobs are relatively worse off compared to richer regions than those in primary jobs. Lobo's results also confirm U.S. studies that marriage is an asset in lower-paying, allegedly more unstable jobs.

The Mexican results lend some strong support to the general concept of different treatment of worker "human capital" characteristics in different kinds of jobs, and -- in contrast to the Brazilian results — that the reward to investment in education and training is probably lower in the lower-status, less desirable jobs. Though Lobo's work cannot tell us about mobility between segments, it appears that formal education has a good deal to say about the segment in which one ends up working.

A Dual Labor Market in the Camerouns

Remi Clignet has undertaken an extensive analysis of labor markets in the "modern" production sector of an African country, the Camerouns (Clignet, 1976). It is difficult to summarize the total of his work in a few pages, since he examines in detail and at langth both the occupational structure and the structure of enterprises in the region of the capital city, Yaounde, plus the industrial area around Douala, Edea, the Mungo, the Ntam and the Wouri. Nevertheless, we can discuss the parts of his analysis which are most salient to comparison with the other studies we reviewed.

Clignet based his study on a sample which attempted to include all wage earners with some minimal skill qualifications working in the industrial area defined above. About 50,000 workers were surveyed in "modern" firms in the period April, 1964 to March, 1965. Of these, Clignet used the information on 36,281 workers in about 414 firms, 3,702 in the public sector, 25,936 in private employment, and 17,551 self-employed. Clignet's principal analysis tests whether there are significant differences between the treatment of individual characteristics and labor market history of two segments of the labor force in this modern sector, manual and non-manual workers. In the sample, 30,582 workers were in manual jobs (about 12,000 are unskilled workers) and 5,696 in the non-manual.

Specifically, he argues that variations in the requirements attached to the performance of manual and non-manual tasks are associated with parallel contrasts in the educational background of corresponding populations and that because non-manual tasks require more universalistic orientation, the educational level of white-collar workers is more independent of ethnic and residential factors. More important from our comparative standpoint, he also tries to show that both education and prior occupational experiences (seniority on the job, seniority in the firm, and prior occupational roles) are more significant determinants of the skill level (type of work done on a scale of one to seven: 1) unskilled task under direct supervision; 2) complex task under direct supervision; 3), 4), and 5) low level supervisory roles with increasingly complex tasks; 6) middle range supervisory functions; and 7) managerial or executive functions) and income of non-manual than of manual workers. Then he goes on to show that occupational attainment of the two groups varies across types of firms; that is, the salaries and hiring and promotion practices of both manual and non-manual workers differ according to size, age, activity, and legal status of firms.

The manual and non-manial workers in Clignet's sample differ greatly in their educational levels: 50 percent of the manual workers have no schooling and 35 percent have some primary, while 36 percent of the non-manual workers have some primary, 51 percent completed primary, and 6 percent completed the first cycle of post-primary. Clignet points out that besides the number of years of schooling, the kind of schooling taken by the two groups also differs, so he constructs a formal "training" scale from 0-20. The average score for non-manual workers is 6.3 and 2.9 for manual. So formal education appears crucial in determining access to each of the two segments. Additionally, the Douala tribe has a disproportionate share of the available non-manual jobs, in part, as Clignet shows, because of their higher average aggregate training score (Clignet, 1976, Table 13, p. 75) in both manual and non-manual occupations.

First job is also important in predicting current job: 75 percent of manual workers and 56 percent of non-manual workers were still engaged in the same activity as when they first joined the labor force. Only 19 percent of white collar workers in his sample entered the labor market as manual workers, whereas only 3 percent of manual workers began their career as non-manual workers. Unfortunately, Clignet does not estimate the determinants of access to non-manual occupations through multiple regression analysis, so we have no way of knowing the relative effect of initial occupational experience, formal education, age, and tribe on current job type.

Neither does Clignet estimate the relative effect of factors determining mobility from one segment to another, although education again seems to be important, especially in upward mobility. Those workers who remained in the manual segment have an average training index of 2.8 while those who moved from manual to non-manual jobs have a score of 5.7; those who moved from non-manual to manual jobs have a score of 6.1, and those who stayed in non-manual jobs have an average score of 6.5. But Clignet finds that the educational contrasts between manual ann non-manual workers are declining (lower age groups have smaller differences than higher age groups), and the role of one-the-job training as a substitute for formal education is also declining in both labor markets (Clignet, 1976, pp. 79-80).

Clignet presents results more comparable with other studies when he analyzes mobility within manual and non-manual occupations. He uses two measures of occupational achievement within segment: first, he defines skill level on a scale of one to seven (described above); second, he uses annual income.

Unlike the other studies we have reviewed, Clignet measures upward and downward mobility of workers between jobs, whether they are in the same segment or not. Having eliminated those individuals who are still performing the same job they had on entry into the labor market, he distinguishes between those wage earners who have experienced upward mobility (based on the prestige, pay and skills attached to particular occupations) from those who have experienced downward mobility and from those who have changed jobs but have not moved up or down on the status scale. Table V-12 shows these movements between first job and current job. In general, regardless of age, a lack of vocational and educational qualifications is significantly associated with downward mobility between first job and current occupation. Taking age into account, we see that additional experience in the labor force (age 35 and older) has a higher mobility pay-off for those with more schooling; indeed, for those in the lowest training score category, increased time in the labor force increases chances of downward mobility, both for manual and non-manual workers. Of course, this may also represent a secular effect: "Yet the relative influence of such credentials also varies with the scarcity of educated job seekers. During the early phases of development, it was difficult for employers to find workers with adequate qualifications, and older individuals encountered few difficulties in successfully negotiating their skills, and particularly so in the white-collar market." (Clignet, 1976, p. 105).

Tables V-13 and V-14 show the multiple regression results for manual and non-manual workers with skill level and annual income as the dependent variables, both measures of mobility within segment. The

TABLE V-12

Mobility between First Job Performed and Present Job by Category of Worker, Age, and Aggregate Training Score (percentage distribution)

Aggregate training score	Mobility			
	Downward	Lateral	Upward	Total
Below 7.0				
Less than 25 years old				
Manual	84.2	5.4	10.4	100.0
Nonmanual	13.5	61.0	15.5	100.0
Over 35 years old				
Manual	87.4	4.9	7.7	100.0
Nonmanual	34.7	48.8	16.5	100.0
7.0				
Less than 25 years old				
Manual	73.0	4.5	22.5	100.00
Nonmanual	20.0	66.0	14.0	100.00
Over 35 years old				
Manual	64.6	9.6	25.8	100.00
Nonmanual	7.7	62.8	29.5	100.00
Above 7.0				
Less than 25 years old				
Manual	80.6	12.9	6.5	100.0
Nonmanual	8.1	79.8	12.1	100.0
Over 35 years old				
Manual	60.0	20.0	20.0	100.0
Nonmanual	6.7	50.0	43.3	100.0

Source: Clignet, 1976, Table 23.

TABLE V-13

Camerouns: Regression Estimates of the Determinants of Skill Level, by Occupational Segment, 1965

(t-values in parentheses)

Independent Variables	Manual Workers	Non-Manual Workers
1. Joint seniority in the firm/ aggregate training scores	0.012 (42.90)	0.010 (18.39)
2. Number of jobs learned or performed	2.410 (43.39)	2.223 (14.28)
3. Age	0.138 (21.00)	0.366 (16.68)
4. Aggregate training score	0.008 (27.04)	0.008 (24.48)
5. Douala origin	9.440 (24.46)	--[a]
6. Upward mobility (between second job and current occupation)[b]	5.001 (46.36)	--[a]
Intercept	0.414	0.744
R^2	0.343	0.330
N	23,210	4,914
Mean skill level	1.707	3.027

SOURCE: Clignet, 1976, Table 25, p. 109.

[a] Not significant.

[b] Dummy variable.

TABLE V-14

Camerouns: Regression Estimates of the Determinants of Annual Income (Adjusted for Work Location), by Occupational Segment, 1965

(t-values in parentheses)

Independent Variables	Manual Workers	Non-Manual Workers
1. Interaction of aggregate training score and seniority in firm	0.002 (73.95)	0.002 (21.83)
2. Aggregate training score	--[a]	0.002 (26.10)
3. Age	—[a]	0.636 (14.93)
4. Number of jobs learned or performed	1.344 (21.61)	--[a]
5. Upper mobility between second job and current occupation[b]	1.952 (16.34)	—[a]
6. Douala[b]	3.975 (15.84)	--[a]
R^2	0.263	0.313
N	23,210	4,915
Mean income (thousands of CFA)	140.50	305.00

SOURCE: Clignet, 1976, Table 33, pp. 132-33.

[a] Not significant.

[b] Dummy variable.

results indicate little difference in labor market treatment of individual characteristics in the two segments. Only age (which Clignet uses as a proxy for seniority on the job and seniority in the firm -- both are highly correlated with age) has a much lower coefficient for manual workers than for non-manual. But aggregate training score and the multiple of aggregate training score and seniority in the firm (interaction term) are similar in both segments. So, even though mean skill level and mean income are much higher for non-manual workers, and even though experience is more rewarded in the non-manual segment, apparently education level differences between workers (and exposure to the modern sector -- the Douala in the manual segment) are the key factors in explaining access to each segment and pay within each segment. Thus, the supply side of the labor market (who gets how much human capital) plays an important role in determining salary and status. Nevertheless, there are also important differences on the demand side: Clignet concludes that formal schooling is somewhat more important in determining skill level and income (contributes more to the R^2 in both equations and has a higher coefficient in the income equation) in non-manual jobs, and that overall occupational experience yields more significant rewards in the white-collar than in the blue-collar labor market. Seniority in the same firm is a better predictor of non-manual attainment than experience acquired on the job, and non-manual wage earnings may substitute high educational credentials for a lack of occupational experience to earn higher incomes, but the degree of freedom enjoyed by their manual counterparts is more limited (Clignet, 1976, p. 134).

Finally, Clignet tests for differences in income by occupational segment and various characteristics of the firms (production units) in which the employees work. For example, he finds that it is among the employees of the newest locally based enterprises that the incomes liked to variable amounts of education and training are most differentiated. Also, increased formal schooling has a higher pay-off in larger firms than in smaller for both manual and non-manual workers. In locally based firms, however, the largest firms (more than 100 workers) do not pay the highest salaries for a given amount of education; rather, those production units with 26-100 workers generally pay the highest salaries for manual and non-manual workers (Clignet, 1976, p. 176).

Clignet also estimates regression equations which relate environmental variables (firm characteristics) to worker annual income. He finds that there is a greater effect of type of firm (size and age) and its sector of activity on the incomes of manual workers than on non-manual (Clignet, 1976, p. 206). He also finds that by restricting the analysis of workers to the most modern sector of activity for each segment (mechanical and metallurgical industries in the case of manual workers and banking and insurance for non-manual workers) he increases the effect of both firm-related variables and personal characteristics in terms of the size of the coefficients of those variables. Thus, for example, within those two "advanced" sectors, the coefficient of age (or seniority on the job) increases substantially, as well as the interaction of seniority and aggregate training score. Clignet concludes:

> ...gross comparisons between the manual and non-manual working population tend to mask very substantial variations *within* the two groups. All workers are employed in distinct types of job(s) performed in varying locales and types of organizations which make their own very specific demands and generate correspondingly different kinds of rewards....
>
> At the same time, the rapid rate of educational development in the Camerouns affects differentially the skill level of manual and non-manual wage earners. There seems to be growing *uniformity* in the importance that various types of

> firms attach to the educational and vocational qualifications in their clerical labor force, but a growing differentiation in the demands that various types of economic organizations impose on their manual workers. Alternatively, however, there also seems to be convergences in the salary policies that these organizations adopt toward blue-collar labor forces but divergences in the strategies they retain toward the non-manual employees. (Clignet, 1976, p. 213)

Some Conclusions from the Industrializing Country Studies

When researchers use U.S.-type occupational classifications to segment the labor market (as in the Brazil, Peru and Mexico studies) the secondary segment is so large among urban workers that it probably incorporates a large percentage of "primary subordinate" workers. This is probably also true in the "production" job segment in Singapore and the "manual" job segment in the Camerouns, which included both unskilled, semi-skilled, and skilled production workers. Indeed, in the latter two studies, we can consider that the comparisons are made more between the primary subordinate and primary independent segments than between primary and secondary. But even in the Latin American studies, "secondary" jobs in urban areas show a significant relation between formal schooling and earnings and experience on the job and earnings. These results raise serious questions as to the definition of secondary labor markets in industrializing countries (just as we have raised this issue in the context of the United States). Who is the secondary worker?

At the same time, we note that in the two studies which tested for mobility between the segments (Singapore and the Camerouns), mobility was much lower than in the United States, and depended more on education and work experience. In all the studies, segments were much more defined by educational characteristics of the workers than in the U.S. studies. In part, this is the result of the greater variance of schooling in the labor force of lower income countries. It may be that in the United States, the greater uniformity of education in the labor force leads to greater influence of the demand side of the labor market (segmentation into different labor markets on non-human capital criteria). Nevertheless, income differences between different segments in the five countries studied are also much greater than in the U.S. (for example, in the Camerouns , the ratio of average non-manual incomes is 2.2:1; in Peru, the ratio between primary independent and primary subordinate is 1.64:1 in 1961 and 1.73:1 in 1972; in Singapore, the ratio between primary and secondary workers is more than 4:1, while in the U.S. the ratio between white males primary independent and primary subordinate workers is less than 1.6:1). Thus, even though education is a more important variable in explaining income differences within segments in lower income countries, the income differences between segments are much larger; indeed, in terms of explaining income differences between segments, formal schooling and experience variables may play a less important role than in the U.S. The only approximation we can make to test this hypothesis is to simulate the earnings of workers in the secondary (primary subordinate) segment assuming that they had the same average education, schooling, and training characteristics as workers in the primary subordinate (primary independent segment in the Singapore and U.S. studies).

In Singapore, making the average schooling, experience, and training characteristics of secondary workers equal to primary workers and using the coefficients of variables in the secondary equation yields an increase of 30 percent in the earnings of secondary workers, but this represents only 9 percent of the difference in average earnings between secondary and primary workers. On the other hand, in the U.S., performing the same simulation using the estimated equation for white male primary subordinate workers in the private sector and the average characteristics of white males in the primary subordinate and primary independent segments increases the earnings of primary subordinate workers by only 17 percent, but this represents 27 percent of the difference in average earnings between primary subordinate and primary independent workers.

Thus, while education and experience may be rewarded in all occupational segments in the urban labor markets of low-income countries, giving support to the human capital view of such markets, and while education differences may be the most common characteristic differentiating segments, the income differences between different groups of occupations (associated with different social classes) may be so large that equalizing education and training has a limited effect on equalizing earnings between segments. Demand side variables, therefore, retain their importance in determining who gets what income. We shall examine these concepts more carefully in the next two chapters.

FOOTNOTES

1. This index varies from 86 for engineers to 2 for unskilled manual workers.

2. However, human capital theory assumes that all workers are on the same education-earnings profiles, so that when less educated workers take more schooling and/or training they should receive similar earnings to those workers with the same (higher) schooling and training. As we shall show later, the income differences between occupational segments are so large that increased schooling of those in the secondary segment has only a small effect on equalizing incomes of those in the two segments.

3. As mentioned, Toledo also estimates the effect of indigenous or Spanish-speaking on the workers principal language. There do not appear to be large differences in the effect of language among labor market segments. For example, in 1961, these were the coefficients of indigenous and indigenous/Spanish-speaking, where each coefficient represents the difference in log earnings of having that characteristic versus speaking only Spanish:

	Segment			
	Secondary	Crafts	Prim. Sub.	Prim. Ind.
Indigenous only	-0.968***	-1.333***	-1.369***	-1.303***
Indigenous and Spanish	-0.122***	-0.120***	-0.097***	.247***

CHAPTER 6

The Implications of Labor Market Segmentation Theory for Educational Planning

We have now reviewed the theoretical basis of labor market segmentation and a number of econometric studies which use primarily cross-section data of worker characteristics, earnings, and job history, to test some of the hypotheses of that theory. The econometric studies find, in general, that there are large earnings differences between workers in the different "segments" of the labor market. In a highly industrialized country like the United States, the characteristics of workers (of the same race) in the secondary and primary subordinate jobs are not very different (secondary workers are somewhat younger), but in the lower income, less industrialized countries where empirical studies have been done, there appear to be important differences in the schooling and training of workers in the various segments. On the other hand, the earnings differences between the segments are much larger in the less industrialized countries than in the United States, and mobility between segments is less than in the United States.

The studies also find that although the pay-off to years of schooling and experience (age) is less in the lower-income segments, it is still positive (of course, this may have something to do with the definition of the secondary segment). Furthermore, although unemployment may be higher and weeks worked per year lower in the secondary labor market than in the primary, the U.S. studies indicate that the job instability which labor market segmentation theory assigns to the secondary market is apparently much less than supposed, both in terms of turnover rates and in the fact that married (supposedly more stable) workers get paid considerably more than single workers in those jobs.

Thus, the econometric work shows that there are some indications of labor market segmentation and other indications that supply side differences in worker characteristics are more important than structural conditions on the demand side. But the most interesting phenomenon indicated by the econometric results is that while the coefficients of education and experience (human capital variables) are positive in the lower paid segments of labor markets in less industrialized countries, and education differences between the various segments are large, earnings differences are so large that equalizing human capital characteristics of lower segment workers to those of higher segment workers has little effect on equalizing earnings. In the United States, however, the coefficients of education and age are small (education-earnings and age-earnings profiles are almost flat), but earnings differences are not so great. In either case, the role of human capital variables in equalizing earnings between segments is relatively limited, even if for different reasons. While neo-classical economists might argue that the econometric research has left out important human capital variables, such as the quality of schooling, we contend, in keeping with segmentation analysis, that structural factors in the labor market -- differential treatment by the economy (and employers) of different groups of workers -- are the principal reason that income differences between workers in different segments exist.

Assuming, then, that there is at least some evidence that segmentation in the labor market exists, what implications does such segmentation have for educational planning in industrializing countries? Going back to Chapter 3, Figure 1, the fundamental relation of our version of segmentation theory is that while all workers probably receive less than their marginal product, the relative gap between marginal product and earnings is greater in the secondary market than in the primary, especially among workers with more schooling and experience in the secondary market. As we discussed in Chapter 2, neoclassical models of labor markets assume that, secularly, wages respond to changes in marginal productivity and that marginal product is a function of the supply and demand of worker characteristics, as proxied by formal schooling, work experience, etc. Under this assumption, increasing the average level of positively valued worker characteristics such as schooling and on-the-job training has a positive influence on productivity (hence, on gross national product (GNP)). Since the distribution of labor productivity is closely related to the distribution of wages and of worker characteristics, any policy which reduces the variance in, say, formal schooling, would contribute to reducing inequality in the distribution of productivity, and therefore in the distribution of wages (income).

Indeed, planning of education has been predicated on these premises. In the early sixties (designated by internal agencies as the Development Decade), a great effort was begun to expand the amount of schooling in the labor forces of low-income countries, primarily because of the alleged contribution of schooling to increased productivity (GNP). Also, planners thought that increasing labor's average training and education would reduce the unemployment rate because more educated workers, being more productive, would be more employable. Now, in the seventies, the *distribution* of income is of great concern (growth of output in the sixties was generally marked by *increased inequality* of income). Again, the solution revolves around the distribution of worker characteristics, with emphasis on the distribution of schooling, again on the assumption that by altering the distribution of worker characteristics, the alteration of productivity distribution will follow, and, hence, the distribution of income (see, for example, Langoni, 1973).

The theory of labor market segmentation challenges these premises and poses an entirely different framework for the role of education in economic development. Chapter 3, Figure 1 shows a positive relation in each of the three labor markets between schooling and productivity; under that assumption -- provided it is correct -- increased education will lead to increased output. However, the productivity-schooling relation, as it is hypothesized in the figure, does not have the same slope as the income-schooling relation: productivity-schooling is steeper than income-schooling in the lowest segment; about the same in the middle segment; and not as steep as income-schooling in the highest segment. Investing in the lowest level of schooling produces a greater increase in productivity *relative* to income increases than in the higher segments. Thus we agree that there may be an increase in productivity from an investment in schooling, but it is difficult to say from the schooling-earnings relation or from the average level of earnings associated with a certain amount of schooling in a given labor market what the schooling-productivity realtion is. We hypothesize that investment in lower levels of schooling will increase productivity much more than earnings increases of people with low levels of schooling would have us believe, but there is no evidence to support this.

Under these circumstances, the relationship between education and productivity may be positive and similar throughout the labor market; but the relationship between wages and education may be very different in segments of the labor market which are successfully "exploited" by employers because of the existence of many unemployed seeking and prepared to do those kinds of jobs from the relationship in those segments which are "rewarded" (or less exploited). If this is the correct characteristic of labor markets, increasing schooling may indeed increase output per capita in a general way throughout the labor market, but increasing education would not alleviate poverty (income) problems as long as poor people worked in the more "exploited" segments. In this sense, the absolute level of schooling in the labor force could be related to GNP per capita, but the relative levels of income of differentially educated groups in the country would depend on the relation between wages and productivity.

The implications of segmented labor market theory for income distribution also follow directly from the earnings/productivity-schooling relation of Figure 1. In the neo-classical model, the distribution of schooling and training should play an important role in the distribution of earnings (income from labor), since earnings are directly related to productivity, and productivity to worker characteristics. In segmentation theory, however, as Figure 1 shows, the main differences in earnings are between segments, and the relation between schooling and earnings depends on the number of people working in each segment. So the distribution of earnings depends primarily on the distribution of *jobs* -- among occupational segments, public/private sector, and capital-intensive, monopoly firms/low-capital-per-worker, competitive firms -- and the wage levels associated with jobs in the different segments.

The results of studies which relate changes in income distribution to schooling over time within a single country indicate that changes in the income value of different levels of schooling has a greater effect on income distribution than the distribution of schooling in the labor force (Carnoy, *et al*. 1976). Elsewhere we have concluded on the basis of these results that government incomes policies are much more powerful in affecting income distribution than changes in the distribution of worker personal characteristics (Carnoy, *et al*. 1976).

The radical theory of labor market segmentation provides yet additional policy implications for income distribution. In most capitalist countries, earnings (or income from labor) constitute less than 65-70 percent of National Income. In many less-industrialized capitalist countries, the figure is probably around 55-60 percent. In effect, then, even under neoclassical assumptions, any policy which attempts to alter earnings distribution through altering the distribution of worker characteristics such as schooling is dealing with less than about 60 percent of income. The other 40 percent is derived from the ownership of land, machines, and other material assets, and, as we know, the distribution of that income is much more inequitable than labor income.

The radical theory argues that one of the principal reasons for segmenting labor markets is to create a perception of class differences within the working class and to create struggle between groups of workers over the labor share of national output. In this way, groups of workers will concentrate their efforts on gaining a greater piece of the 60 percent of GNP rather than banding together with other workers to increase the overall labor share of output. The owners of physical capital, in this formulation, have a vested interest in keeping workers conflicting with one another over their share of the wage bill: White-collar workers conflicting with blue-collar workers; blue-collar production workers with "unskilled" workers; male workers with women; blacks with whites; members of one ethnic group with members of another group; workers in one sector of the economy with workers in another sector. This kind of division may mean that some workers are paid more relative to their marginal product (one source of conflict is differential pay), but at the same time other workers may be paid less. The point is that "labor" develops different life styles because of differential income and decision-making power associated with different market segments, and the different segment groups focus on inter-worker conflict rather than working-class solidarity to get more income and better working conditions for all workers.

Income distribution policy in a segmented labor market, then, cannot focus on the redistribution of worker characteristics as the primary instrument of change. Rather, the focus of such a policy should be on the wages attached to different kinds of jobs (the distribution of earnings) and the share of output going to labor. In addition -- particularly if there is evidence of a significant relation between productivity and worker characteristics -- the distribution of skills contributing to worker productivity should also be changed. But the latter policy should be seen as *rationalizing* the altered income distribution rather than being the cause of it.

The hypothesized relations of Figure ___ also imply that equalizing earnings distribution between the segments may actually make wages closer to marginal productivity: for example, raising earnings in the secondary segment relative to wages in primary subordinate and primary independent jobs may not mean that low-paid workers receive *more* than their product (as neo-classical economists tend to claim), making the allocation of resources between labor and capital "inefficient;" rather, national income would be shifted from capital to labor, but in a way that makes the allocation of resources more "efficient." Of course, neo-classical labor market theory assumes that resources are being allocated efficiently under perfect competition; segmentation theory assumes that workers are *not* receiving their product and that secondary workers are probably "exploited" more than more educated workers. Thus, equalizing income distribution under segmentation theory does *not* imply a trade-off with efficient allocation of resources and a lowering of the growth rate. Indeed, promoting long-run higher rates of growth may require earnings equalization as a prerequisite to mass mobilization of the labor force (Gurley, 1973).

Finally, what is the meaning for employment policy of segmentation theory? The radical version of the theory argues that, in capitalist economies, employers will indirectly attempt to increase the size of the reserve army of the unemployed through fostering immigration and reducing labor force requirements by developing and adopting labor-intensive technology. In addition, of course, we are now witnessing the movement of industries to low-wage labor markets for manufacturing and export back to the high-wage countries. At the same time, employers replace low-educated older workers with more highly educated (and supposedly eventually more productive) younger workers.

This process in capitalist economies continuously reduces the absolute number of jobs required to produce a given output. Raising the average level of schooling will only contribute to increasing employment if a more highly educated labor force (not necessarily a higher-paid labor force) serves to call forth more investment. Otherwise, increasing the average level of education may actually reduce the absolute number of available jobs.

Segmentation theory argues further that high unemployment is concentrated in certain segments of the labor market and that these segments in a capitalist economy essentially require a reserve army of unemployed in order to function. Indeed, the low wages of such jobs and -- in a sense -- their very existence depend on large numbers of people having to work in them for low wages because of lack of access to better jobs. But it is difficult to say whether high unemployment in certain segments creates the characteristics of those segments or whether the capitalist class has chosen certain segments in which to concentrate their creation of a reserve army of unemployed. Clearly, it is more acceptable to a society run by middle-aged men to have unemployment concentrated in young people, women, and minority groups. Since unemployment of these groups is especially high, they populate those parts of the labor force where wages are low (they are willing to work in such jobs because alternatives are limited for the highly unemployed) and where the jobs are characterized by high probability of lay-offs.

From a policy standpoint, then, giving more education to these groups will not raise employability, according to segmentation theory, because it is the nature of the labor market and the capitalist control of that market which determine the level of unemployment and those who are more susceptible to being unemployed. For example, the fact that young blacks and Mexican-Americans in the United States now have an average of twelve years of schooling instead of the eight years they had two decades ago has not improved their employability. Segmentation theory argues that the highly unemployed participate, on the average, in different segments of the labor market than the highly employed; thus, to decrease unemployment, low-unemployment segments have to increase their levels of employment relative to high-unemployment segments, or, alternatively, the nature of the labor market segment in which the highly unemployed participate must change. The schooling level of the labor force has little to do with this, even though an individual can improve his or her chances of being employed by increasing his/her level of schooling.

We have argued elsewhere (Carnoy, 1976) that it is in the interest of capital owners to maintain a reserve army of unemployed -- even if it is necessary to import labor -- to compete with employed labor and thus to keep wages low. Certainly, full employment is not in the interest of the bourgeoisie. Under this assumption, which stems from the radical theory of segmentation, high growth rates and educating the labor force will not necessarily decrease the unemployment rate. If we observe rates of unemployment in industrializing economies, even with high rates of growth, we see that they change little unless there is a political change which gives more power to organized labor. Indeed, we note that there is a very high correlation between full employment and the political power of labor organizations. Therefore, quite contrary to the neo-classical view that labor union (or syndicate) strength interfers with attaining full employment, we argue that full employment is a political issue, a part of the struggle of labor and capital over national income, and thus labor organization political strength has a direct and concrete influence on achieving greater employment of labor, not less (Carnoy, 1976).

In general, then, segmentation theory points policy makers and planners much more toward *structural changes* in the economy rather than changes in the characteristics of the labor force to increase growth, equalize income distribution, or lower the unemployment rate. These structural changes imply a change in *political power*, for it is only with such a change that labor can win gains at the expense of capital.

Educational planning in this context requires understanding the political/economic factors which impinge on the expansion of education and on educational reform (Carnoy and Levin, 1976). The planner should view his/her function as more than simply increasing by the most efficient means the amount of schooling in the labor force. Further, the planner must understand the limitations of reducing poverty, equalizing incomes, or reducing unemployment by means of schooling or training, whether it be formal or informal. The segmentation model argues that increased schooling can only achieve a small percentage of the results claimed for education and training by human capital theory. In order for educational expansion and reform to be effective in achieving economic and social change, they must be accompanied by an employment policy which not only creates more jobs (through taxation and other incentive policies, as well as direct State employment), but the creation of more "primary" jobs, or changing the conditions of employment and pay in the secondary market, in part through an incomes policy which equalizes earnings among workers by raising lower incomes relative to higher.

As we discussed in Chapter 3, the contention of neoclassical economists (like Wachter, 1974) that secondary workers are in that market receiving lower pay because they are inherently different (not as well trained and poor workers) from those in primary jobs is open to serious question by the fact that rapid increases in the average level of schooling of groups traditionally in secondary jobs does not lead to their incorporation into the primary market unless there is a corresponding increase in the number of primary jobs. It is the number of primary jobs (higher incomes) available which is crucial to this change. Similarly, equalizing the distribution of schooling contributes to the equalization of income distribution only if incomes policy is such to equalize incomes simultaneously. It is the incomes policy which is crucial to this change, although educational equalization certainly can make a significant contribution (Carnoy, 1975).

CHAPTER 7

An Agenda for Future Research

It should be clear from our review of the econometric studies in the United States and in lower-income countries, that a great deal of research remains to be done before we have a comprehensive picture of labor markets and the relationship of education to income in highly industrialized and in industrializing economies.

In spelling out an agenda for research we believe will be useful in building this comprehensive picture, we start from Piore's premise that we "do not want to ignore the econometric evidece; but [we are] much more likely to infer from that evidence that [we] got the structure wrong or that *they* [the analysts doing the econometric research] got us wrong than that the labor market structures [we] have talked about have no reality and do not require an explanation" (see Wachter, 1974, p. 685). In other words, we feel that there is enough observable and historical evidence to support a dialectical view of labor market development, including the conflict between labor and capital and its impact on the division of labor. The econometric studies we reviewed show that there are earnings differences between different groups of workers (blue-collar and white collar, for example) which apparently cannot be explained by differences in the human capital of the workers in the two groups. Further, there are differences in the treatment of workers in different kinds of jobs, either in the pay-off to their investment in human capital or in the fact that different labor market experiences (time in the job market versus seniority in the firm) are rewarded differently in different kinds of occupations. Also, mobility between labor market segments in low income countries is apparently quite limited, and first job is highly influential in determining future work history.

But there are a number of difficulties with the studies completed until now, particularly those in the low-income countries. First, the definition of the different segments must be clarified: it must emerge from a theory of labor markets, not just from a concept that there are different sets of occupations with little mobility between them and governed by somewhat different rules. In Chapter 3, we presented several views on what these definitions of the segments should be in the historical context of U.S. capitalist development and the characteristics of each segment which emerge from those definitions. In the review of econometric research in the low-income countries, we indicated that, for example, "secondary" jobs as defined in the Singapore, Brazil, and Mexico studies are not comparable to secondary jobs as defined in the U.S. studies (even though in the Latin American research, the U.S. definition of secondary census occupations was used as a base to define secondary jobs in those three countries). The difference in the nature of secondary jobs in industrializing countries and in the United States lies in the difference in the historical development of capitalism and of labor markets in those countries. One of the most important developments in U.S. capitalism, and especially influential in its effect on labor market structure (as we discussed in Chapter 3), was the emergence of monopoly capitalism in the late nineteenth century. But in the countries studied in Chapter 5, monopoly capitalism has come partly in the form of state corporations and partly in the form of transnational private companies, bringing technology and labor market structures from abroad. Of course, the most obvious difference between secondary markets in today's United States and the industrializing countries is the large immigration to the cities from rural areas in the latter. That migration took place in the United States in the early part of the Twentieth Century, and it was accompanied by a massive immigration from the rural areas and towns of Europe. Thus, while there may be similarities between industrial development and labor market structural conditions of early Twentieth Century United States and today's industrializing economies, there are also important differences. All of these have to be analyzed in coming to a theoretical understanding of labor market segments in those countries.

Given these difficulties with the current crop of segmentation studies, we can recommend a number of items for a research agenda which could contribute to that understanding:

1. Certainly one of the most important items on a research agenda for investigating labor markets in lower-income countries is to analyze labor market conditions from an historical perspective in the context of world capitalist development. From this type of analysis, the theoretical base for the definition of different segments and the dynamic of change in those segments should emerge. In particular, we should get a clearer understanding of the meaning of "secondary" jobs in such economies. There has already been some theoretical and empirical work done on "marginal" populations as part of dependency theory (Miriam

Waiser has information on this;(Perlman, 1975) as well as some recent work on urban artisans in Kenya (call Myers on this), but this theory has to be tied into a meaningful definition of who secondary workers are in a low income, industrializing situation. This entails observing the tasks that workers do within the census definition of various occupations, and the employment and work conditions of those occupations.

2. In conjunction with the problem of definition of secondary jobs, empirical work should be done to analyze which occupations are subject to pressure from recent migrants to urban areas. In other words, what is the occupational history of such migrants? What kinds of jobs are available to them? What is the mobility pattern in jobs of different aged immigrants? Is there a correlation between job stability (turnover rates, seasonal employment, and part-time employment) and the jobs that are held primarily by recent migrants? Are there whole categories of jobs which do not require much education but are closed to recent immigrants? What are the characteristics of such jobs? For example, are they more highly unionized?

3. Little work has been done in the United States or in other countries on the relation of the social class (including rural origins, or recent migrant status) origins of workers and the kinds of jobs they hold and/or their mobility. Andrisani had a social class variable in his equations, but the nature of his segment definitions make it difficult to assess the impact of social class on mobility. Liu included a social class variable in his equations, concluding that the effect of social class is felt largely through the amount of schooling taken by individuals, and the first job in the labor market and the firm. Both

these studies give us clues that the individual's social class may have important direct and indirect (through schooling) influence on the job segment in which he starts to work and ends up working. More research must be done to understand the ties of social class to segment of the labor force, especially the dynamic of changes in this relationship over time as the economy develops.

4. More research is needed which tests our concept of the "unionized" segment and the role of unions in preventing mobility from the non-unionized to the unionized segment or on the use of unions in a capitalist economy to create divisions in the labor force. Liu found that within segments membership in a trade union offered no earnings advantage among the workers he sampled (Liu, 1975). He argues that "This is expected since the labor unions in Singapore are government-controlled, and play a very restricted role in wage bargaining" (Liu, 1975, p. 29). Does the nature of the trade union movement in different countries affect the nature of labor market segmentation? Again, historical studies are needed to define the role of unions in different countries.

5. In most lower-income countries, the public sector employs a very high percentage of the highly-educated labor force. What is the influence of public sector employment on labor market mobility of, for example, low social class workers? What effect does the existence of a large public employment sector -- often including manufacturing as well as services -- have on divisions in the labor market, mobility patterns, the role of trade unions, etc.? Does the public sector differ significantly in its internal labor markets, treatment of workers, and hierarchical relations from, for example, the large private corporation? Does

the public sector treat worker characteristics differently from the private sector in various types of jobs? We have undertaken a detailed analysis of public sector employment in the United States (Carnoy, Girling, and Rumberger, 1976), concluding that the public sector has been a major source of upward mobility for two important "marginal" groups in the United States: blacks and women. Government employment pays higher wages to these two groups and lower wages to white males for similar types of jobs. But internal labor markets in the government bureaucracy seem very similar to those in the concentrated industries of the private sector (to which access by blacks and women is limited). Since the public sector plays an even more important role in most industrialized economies and many lower income countries (in terms of the percentage of employment and percentage of GNP accounted for by public sector expenditures) than in the United States, research on labor markets and the role of education in mobility between and within segments should focus more on the influence of the government sector than it has in the past.

6. Once segments are better defined in lower-income countries (historically, and by studying the nature of job characteristics and mobility profiles by different groups), research can focus on estimating differences in the treatment of worker characteristics like formal schooling and training on mobility between segments and earnings within segment, where segments are defined not only in terms of jobs, but in terms of types of industries, and in terms of a combination of job type, industry, unionization, access to migrants into cities, and perhaps public/private employment. We recommend recursive models such as the

one estimated by Liu in Singapore, since such models enable the researcher to estimate the direct *and* indirect effect of various independent variables on mobility and earnings. Through the recursive model, we can trace an approximate longitudinal job history within each segment, estimating the influence of each independent variable on that history.

7. Finally, research should estimate (or at least approximate) the relative importance of labor earnings and the earnings of capital in the national income. As part of our understanding of the effect of policies which alter earnings composition in the labor force and the role of education and training in those policies, we should have some estimate of what the relative importance of those policies is in relation to the income of capital and those who control that capital (the state? private owners? multinational corporations?).

If we had, for a given economy, the kind of in-depth studies of jobs, sectors of work, and job histories outlined here, we would be in a strong position to understand better the operation of labor markets in that economy and to develop sensible, realistic policy recommendations for education and training in that economy. Rather than expecting education to solve the problems of growth, income distribution and employment, we could prescribe policies that were realizable and might achieve improvements for the poor.

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